

APPRENTICESHIP TRAINING

PARTSMAN Program



CAREER DEVELOPMENT AND EMPLOYMENT
Apprenticeship & Trade Certification



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PARTSMAN TRADE

THE GOAL OF APPRENTICESHIP TRAINING

To develop a competent tradesman who, through skill and knowledge, is capable of productive performance in all the areas of the parts and accessories businesses serving the Automotive, Agricultural and Heavy Equipment Industries.

THE PRODUCT OF APPRENTICESHIP — a graduate who will:

- ★ Have a comprehensive knowledge and understanding of the printed catalogue as well as the developments in electronic systems and methods used in the identification, location, and supplying of parts and assemblies to repair shops and individuals.
- ★ Know the characteristics and understand the actions and interactions of those skills and knowledges required to coordinate and determine the most favorable behavior of parts and material inventories maintained by dealers, jobbers and other types of outlets.
- ★ Relate to the work of other tradesmen in the Partsman industry.
- ★ Perform assigned tasks in accordance with quality and production standards required in the industry.
- ★ Be knowledgeable in all aspects of the proper procedural methods for the safe handling and warehousing of all classes of parts and materials.
- ★ Demonstrate the accurate, prompt identification and application of parts and assemblies required to maintain the serviceable condition of pleasure, commercial, industrial and agricultural vehicles and machines.
- ★ Demonstrate the productive application of skills and knowledge necessary to initiate and develop effective communication by the intelligent use of the telephone, telex, memos and as well, have an adequate understanding of the position of electronic and computerized equipment in the present day Parts Business.
- ★ Demonstrate the ability to recognize and develop situations which are particularly relevant to customer satisfaction, human relations and product promotion.
- ★ Cultivate an attitude or work ethic which will encourage the practice of good interpersonal skills and honesty.
- ★ Maintain a standard of professionalism suitable to the position of responsibility held by the Partsman.
- ★ Adapt and develop ability to move with confidence between sectors of the trade.
- ★ Possess the ability to assess problems and provide corrective measures as they occur.

PARTSMAN APPRENTICESHIP INFORMATION

Basic Requirements:

- ★ Indenture for three periods of Trade experience.
- ★ Attend an eight week technical training course in the first period and a six week technical training course in each of the second and third periods.
- ★ Fulfill the requirements for each period including 1800 hours of work experience inclusive of time spent at the training course; successfully complete the technical training course and obtain a satisfactory employer's report.
- ★ Education — a minimum requirement is the completion of grade ten or a pass on an equivalent entrance examination as prescribed by the Trade regulation.
- ★ Age — the minimum age for apprentices is 16 years. There is no upper age limit.

Credits:

- ★ Accelerated patterns of apprenticeship may be granted for related technical training and/or experience.

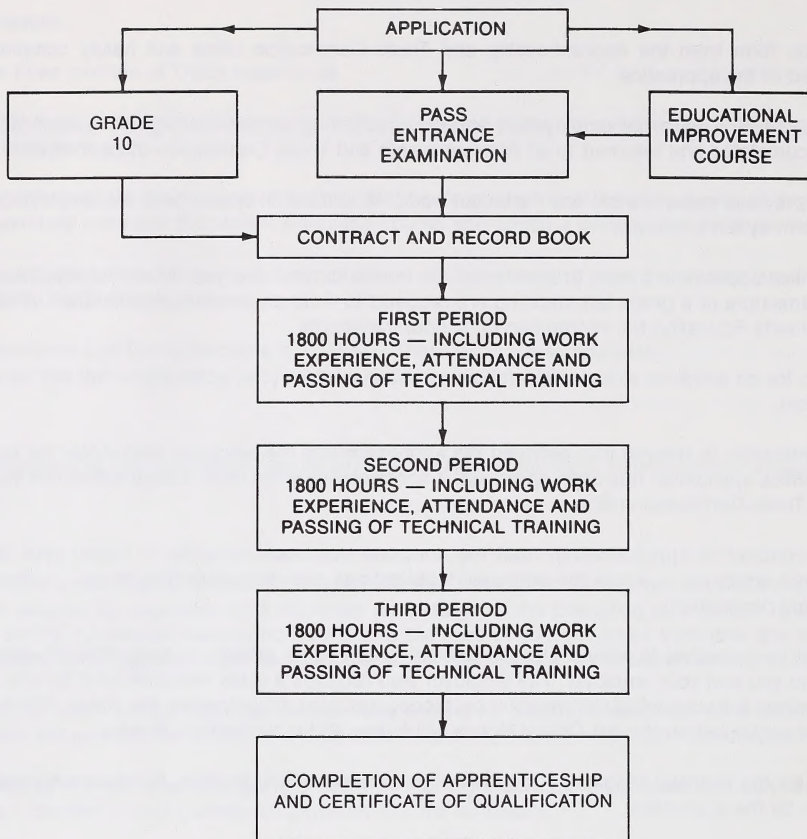
Benefits:

- ★ Apprenticeship is a learning-while-earning program. During the apprenticeship period, while working at the trade, apprentices are assured by regulation of a minimum percentage of the prevailing journeyman rate: 65% during the first period, 75% during the second period and 85% during the third period. Progress from one rate to the next takes place only after successful completion of all the requirements for each period. (details are outlined in the Record Book).
- ★ All apprentices 17 years of age and older are normally eligible for training allowances while attending technical training courses. These allowances are funded by the Canada Employment and Immigration Commission.
- ★ Administrative procedures establishing the amount of training allowance is complex and can vary with an individual's circumstances. Contact a local Canada Employment Centre for details.
- ★ An apprentice who successfully completes the program will graduate with an Alberta Completion of Apprenticeship Certificate and a Certificate of Qualification.
- ★ The most significant benefit to the graduate apprentice is that he is well trained in technical and practical aspects of the trade and is able to make a worthwhile and productive contribution to society. Society in return, will provide an opportunity for livelihood.

DIRECTIONS FOR PROSPECTIVE APPRENTICES

- ★ Contact your nearest Apprenticeship and Trade Certification office for detailed information and counselling (see list of offices on page 57).
- ★ Obtain an application form from the Apprenticeship and Trade Certification office and neatly complete, in full, the information requested of the apprentice.
- ★ Persevere in the search for apprentice employment and upon obtaining employment, give the application to the employer. It should be completed and returned to an Apprenticeship and Trade Certification office forthwith.
- ★ Any time credit, for previous experience in the Partsman trade, should be discussed with the employer and requested on the application form by the employer.
- ★ Attach to the apprentice application a copy (transcript) of the marks for your last year of school. Applicants who do not have their school transcripts or a grade ten standing are required to write an entrance examination. If transcripts have been lost, contact Alberta Education for information on school transcripts.
- ★ Prepare to be called for an entrance examination following submission of your application. You will be advised of the date, time and location.
- ★ A contract of apprenticeship is entered into between the apprentice and the employer and should be signed within 90 days after the apprentice application has been approved. If contracts have not been issued within this time, contact the Apprenticeship and Trade Certification office.
- ★ Before signing the contract of apprenticeship read the complete document carefully — know your obligations and responsibilities to your employer — know the employer's obligations and responsibilities to you — feel confident you have selected the right occupation.
- ★ Know when you will be expected to attend classes and be prepared to attend. In early May of each year, School Schedules are sent to you and your employer. The employer also receives a class selection card for you, which is to be completed and submitted for scheduling. Information on procedures also accompanies the above. Confirmation on the date you actually get scheduled and/or the Official Notice will follow at the appropriate time(s).
- ★ Prepare in advance for the financial obligations required of you during school training. Reference materials and school supplies are paid for by the apprentice.
- ★ While an apprentice, it will be your responsibility to respond promptly to mailed directions and requests from Apprenticeship and Trade Certification.

APPRENTICESHIP ROUTE TOWARD CERTIFICATION



APPRENTICESHIP COMMITTEE STRUCTURE

Partsman Provincial Apprenticeship Committee

The Provincial Apprenticeship Committee for the Partsman Trade is comprised of members from Local Apprenticeship Committees from the cities of Edmonton, Calgary, Fort McMurray, Grande Prairie, Lethbridge and Hinton.

This Committee is concerned with the policies that guide the program and make recommendations to the Apprenticeship and Trade Certification Board and the Executive Director of Apprenticeship and Trade Certification in the following areas:

- ★ Contribute current information relative to changes in the trade and requirements of industry.
- ★ Make recommendations for changes to existing trade regulations.
- ★ Assist in updating of the training program through recommendations for revisions to the course outline and attendant examinations.

Partsman Local Apprenticeship Committee

Local Apprenticeship Committees are concerned with individuals and trade situations within a local region. Meetings are held throughout the year to make recommendations and to discuss problems relating to the apprenticeship program. Members who serve on committees are nominated by employer and labour organizations, and membership is equally divided into employer and employee representation in accordance with The Manpower Development Act.

Apprenticeship Committee Members:

Mr. A. G. Radford — Edmonton — Employer
Mr. A. A. Zygun — Edmonton — Employee
Mr. L. Vallee — Edmonton — Employer
Mr. D. A. Fisher — Calgary — Employer
Mr. C. S. Bruce — Calgary — Employer
Mr. R. R. Heptonstall — Calgary — Employer (Alternate)
Miss P. H. Holden — Calgary — Employee (Alternate)
Mr. J. E. Rainey — Calgary — Employee
Ms. M. L. Muir — Calgary — Employee
Mr. B. B. Dobbs — Fort McMurray — Employee
Mr. C. W. Nalder — Fort McMurray — Employer
Mr. P. A. Willett — Fort McMurray — Employer (Alternate)
Mr. M. Turner — Grande Prairie — Employer
Mr. D. M. Crowell — Grande Prairie — Employee
Mr. W. G. Winters — Lethbridge — Employee
Ms. M. P. Reber — Hinton — Employee
Mr. K. W. Scatchard — Hinton — Employer

PARTSMAN PROGRAM COURSE OUTLINE OVERVIEW

This outline has been prepared in accordance with recommendations from the Provincial Apprenticeship Committee for the Partsman Trade in the Province of Alberta.

The outline was updated following consideration given to recommendations and suggestions from:

- Local Apprenticeship Committees
- Representatives from training institutes
- Curriculum Sub-Committee from the Provincial Apprenticeship Committee

Course objectives will be considered as "Terminal Performance Objectives" which do not concern themselves with the text used, course delivery, or the kind of classroom experience the trainee might receive. They describe the performance expected of the trainee at the end of the training.

PROCEDURES FOR RECOMMENDING REVISION(S) TO THE COURSE OUTLINE

Any concerned citizen or group in the Province of Alberta may make recommendations for change by writing to Apprenticeship and Trade Certification, Edmonton.

It is requested that recommendations for change refer to specific areas and state references used. Recommendations received will be placed before regular meetings of the Provincial Apprenticeship Committee.

PREFACE

The lectures, demonstrations and assignments listed in the course outline are intended to familiarize the Partsman apprentice with the scope of his trade and to train him in necessary skills. Classroom subjects were carefully chosen to relate to the skills required in modern Parts Departments and are minimal requirements.

- ★ The nature of the Partsman occupation is such that the emphasis and scope of the humanity skills are much more relevant than in most of the other mechanical trades.
- ★ To reinforce this position, the curriculum application can allow for a trade orientation package by the instructional staff, in which 6 to 9 hours immediately following First Period registration would be employed to formally acquaint the apprentices with the circumstances of their chosen trade.
- ★ "Developing necessary personal attributes"; "Dimensions and the expectations of the industry"; "An overview of the curriculum"; are only examples of topics which could set the stage for the ensuing periods of technical training and/or work experience.
- ★ The advantageous development of this innovation will, of course, be at the discretion of the individual instructional people. The apparent merits of a trade briefing warrant its inclusion at this point.

The Sequence of Material Sections

The numerical sequence of material sections, in any one period as shown in the curriculum, does not necessarily prescribe a compulsory adherence in the actual training application.

In practice, the rearrangement or concurrency of material coverage may well be much more objective depending upon prevailing conditions and circumstances.

Parts Recognition and Catalogue

THOUGH THE INDICATED SEQUENCES OF CURRICULUM HEADINGS IN ANY ONE PERIOD OF TECHNICAL TRAINING MAY BE BENEFICIALLY REARRANGED, IT IS UNDERSTOOD THAT THERE MAY NOT BE ANY ADJUSTMENTS IN THE PRESCRIBED DEPTH AND SCOPE OF THE MATERIAL COVERAGE.

SAFETY EDUCATION

Safe working procedures and conditions, accident prevention and the preservation of health is of primary importance in the Apprenticeship programs in Alberta. These responsibilities are shared and require the joint efforts of the government, employers, employees and the general public. Therefore, it is imperative that all parties become aware of circumstances that may lead to injury or harm and that safe learning experiences and environment can be created by controlling the variables and behaviors that may contribute to or cause an accident and/or an injury.

It is generally recognized that a safe attitude contributes to an accident free environment. As a result a healthy safe attitude toward accident prevention will benefit an employee by helping to avoid injury, loss of time and loss of pay.

A tradesman is possibly exposed to more hazards than any other person in the work force and therefore, should be familiar with the Occupational Health and Safety Act and Regulations dealing with his own personal safety and the special safety rules applying to each job.

LEGAL AND ADMINISTRATIVE ASPECTS

Employer's Responsibilities:

Accident prevention and the provisions of safe working conditions are the responsibilities of an employer. The company is responsible for:

1. The provision and maintenance of safety equipment
2. The provision of protective devices and clothing (as required by the Occupational Health & Safety Act, General Safety Regulations)
3. The enforcement of safe working procedures
4. Adequate safeguards for machinery, equipment and tools
5. Observance of all accident prevention regulations
6. Adequate training to allow a worker to use or operate equipment in an effective and safe manner.

Government's Responsibilities:

Apprenticeship and Trade Certification in conjunction with the respective Provincial Apprenticeship Committee assumes the responsibility to assure that adequate safety is reflected in the curriculum and that adequate safety instruction is presented at the training establishments.

The Occupational Health and Safety Inspection Branch assumes the responsibility for periodic inspection of the operation to ensure that regulations for industry are being correctly observed.

Individual's Responsibilities:

The employee is responsible for:

1. Knowing and working in accordance with the safety regulations pertaining to job environment and
2. Working in such a way as not to endanger himself or his fellow employees

The major factor in safety is the individual employee, his personal attitude toward safety and having an awareness of the respective safety regulation.

SUGGESTED WORK EXPERIENCE

The following list of suggested "work experience" is provided as a guide for the apprentice to relate application of hand skills with technical training during his/her apprenticeship program.

FIRST PERIOD

1. Use of administrative structure (policies and procedures)
2. Procedures for safety and emergencies (fire prevention and control)
3. Use of proper forms
4. Duties and responsibility of the receiver
5. Duties and responsibility of the shipper
6. Use of proper stocking and picking procedures
7. Introduction to parts identification
8. Introduction and use of catalogues, microfiche and computers
9. Use of communication skills
10. Handwriting skills

SECOND PERIOD

1. Introduction to and identification of more complex assemblies and systems
2. Identification of auto body repair parts and components if applicable
3. Identification of farm equipment repair parts and components if applicable
4. Identification of industrial repair parts and components if applicable
5. Use of catalogues, microfiche and computers
6. Application of catalogues
7. Regulatory requirements for specific components

THIRD PERIOD

1. Essential details of inventory management
2. Introduction to physical inventory count
3. Introduction to displays and merchandising
4. Salesmanship
5. Introduction to planning a parts facility
6. Complete use of all business machines
7. Use of all communication skills and techniques
8. Human relations skills
9. Introduction to parts manager responsibilities

PARTSMAN PROGRAM

Subjects and Time Distribution

First Period	8 Weeks	30 Hours Per Week	240 Hours
Section One:	Stock Handling Procedures		30
Section Two:	Safety and Warehousing		15
Section Three:	Identification of Parts		150
Section Four:	Standard Stock and Materials		10
Section Five:	Catalogues		20
Section Six:	Communication		15
Second Period	6 Weeks	30 Hours Per Week	180 Hours
Section One:	Identification of Assemblies and Their Parts		160
Section Two:	Catalogues		10
Section Three:	Catalogue Application		10
Third Period	6 Weeks	30 Hours Per Week	180 Hours
Section One:	Inventory Control Procedures		100
Section Two:	Sales and Merchandising		50
Section Three:	Communication Skills and Human Relations		30

FIRST PERIOD TECHNICAL TRAINING PARTSMAN TRADE COURSE OUTLINE

OBJECTIVE:

To instruct the Partsman apprentice in those procedural details of the Parts Department which will increase his/her immediate productivity and in addition, introduce him/her to the recognition, characteristics and functions of the fundamental parts used in the proper maintenance of those equipment and vehicles which are serviced through the facilities of wholesale jobbers, automotive, heavy equipment and agricultural equipment dealers.

SECTION ONE: 30 Hours

TOPIC

COURSE OBJECTIVES

Upon successful completion of each section the apprentice should be able to:

A. Receiving

15 Hours

1. Shipments

1. Inspect shipments for damaged containers.
2. Use claims procedures for damaged contents.
3. Identify and properly handle specially marked containers.

2. Packing lists

1. Use the packing list to identify discrepancies.
2. Identify and record back orders from the packing list.
3. Correctly identify the number of pieces of a shipment.
4. Use suitable records for receipts of shipments.

3. Recognition of items

1. Ensure correct identification of all items.
2. Recognize tagging or marking of all items.
3. Ensure proper procedures for handling of unidentified items.
4. Ensure accuracy of item counting (especially high count items).
5. Be aware of number change precautions (superceded numbers).
6. Use a system for sorting procedures.
7. Use and understand the importance of correct terminology.

4. Forms

1. Recognize and use the proper forms for:
 - (a) shortage and damage claims
 - (b) entries and signatures
 - (c) customs and brokerage procedures
 - (d) Canada customs invoice
 - (e) way bills
 - (f) invoices
 - (g) receipts
 - (h) relationship of proper receiving to inventory control
 - (i) determining the paper flow patterns and routine
 - (j) raising notes to supplier re shortages and overages
 - (k) probills
 - (l) credit memos
 - (m) inventory transfer between branches

B. Shipping

15 Hours

1. Incoming orders

1. Identify and use the proper procedures for incoming orders according to form:
 - (a) mail
 - (b) telex
 - (c) telephone
 - (d) on-line computer

TOPIC

COURSE OBJECTIVES

- | | |
|---|---|
| 2. Picking | <ol style="list-style-type: none"> 1. Use picking procedures, precautions and safety for: <ol style="list-style-type: none"> (a) awareness of methods and techniques other than manual (b) value of prescribed traffic patterns and sequences (c) safe use of power lifting equipment <ol style="list-style-type: none"> (i) awareness of regulations and company rules (ii) recognition of weight and movement limits (iii) limitations of docks and platforms (iv) moving and stacking of pallets and containers (v) use of protective coverings (vi) recognition of proper use of traffic patterns (vii) recognition of unsafe operating conditions |
| 3. Order assembling methods and routine | <ol style="list-style-type: none"> 1. Use and interpret prescribed routines and sequences for: <ol style="list-style-type: none"> (a) labour and material economies (b) avoiding unnecessary backorders and duplication (c) assignment responsibility |
| 4. Sorting | <ol style="list-style-type: none"> 1. Sort items in relation to packing methods: <ol style="list-style-type: none"> (a) fragiles — marking as such (b) perishables — marked on container and waybill (c) selection of packing methods <ol style="list-style-type: none"> (i) in relation to transportation method (ii) in relation to duration and type of route (iii) handling frequencies (iv) labelling (v) dangerous goods labels |
| 5. Forms | <ol style="list-style-type: none"> 1. Identify and properly use forms for: <ol style="list-style-type: none"> (a) invoices (b) waybills or bills of lading (c) hazardous goods (d) packing lists (slips) — identify location (e) handling C.O.D. shipments (f) shipping instructions as to <ol style="list-style-type: none"> (i) transportation method (ii) route and distribution points (iii) consignee notification (iv) choice of carrier (g) shipment description and labelling <ol style="list-style-type: none"> (i) "collect" or "prepaid" (ii) check-off method 1 of 6, 3 of 7, etc. (h) insurable items (when necessary) (i) provisions for tracing shipments (shipment log book) |
| 6. Routing | <ol style="list-style-type: none"> 1. Identify and use proper routing procedures. |
| 7. Transportation rates and schedules | <ol style="list-style-type: none"> 1. Interpret transportation rates and schedules including: <ol style="list-style-type: none"> (a) calculation of discounts, totals, weights and measures (b) F.O.B. point |
| 8. Shipping procedures | <ol style="list-style-type: none"> 1. Demonstrate and practice safe shipping procedures including: <ol style="list-style-type: none"> (a) identification labelling <ol style="list-style-type: none"> (i) fragiles (ii) weight (iii) recommended handling, methods (use no hooks) etc. (iv) shipping positions (do not stack) etc. (v) special instructions (labels, placard) etc. (vi) perishables (exposure above or below given temperature) |

SECTION TWO:**SAFETY AND WAREHOUSING****15 Hours****TOPIC****COURSE OBJECTIVES**

Upon successful completion of each section the apprentice should be able to:

A. Warehouse Storage Procedures**6 Hours**

1. Storage
 1. Identify and demonstrate storage by classification for:
 - (a) parts number sequence
 - (b) related parts or groups
 - (c) speed of movements
 - (d) manufacturer
 - (e) area of usage
2. Location of items and materials
 1. Identify and be aware of advantageous locations of specific items and materials in the warehouse for:
 - (a) weight, shape and dimension consideration
 - (b) item movement considerations
 - (i) fast moving
 - (ii) rotational
 - (iii) seasonal
 - (iv) overstock
 - (v) cores
 - (vi) warehouse traffic patterns
 - (vii) special procedure for kits
 - (c) handling of item considerations
 - (i) bulk
 - (ii) promotional
 - (iii) returns
 - (iv) bearings and bushings
 - (v) displays
 - (vi) dangerous goods
 - (vii) fragile items
 - (d) proper use of shelves and bins
 - (i) efficiency
 - (ii) safety
 - (iii) protective considerations (height and depth factors)
 - (e) provisions for use of mechanical and/or electronic equipment
 - (f) awareness of the effects of climatic conditions on certain material or items
 - (i) humidity and temperature
 - (ii) rubber (seals, mouldings and gaskets)
 - (iii) light fabrics
 - (iv) perishable items
 - (v) cork and other gaskets
 - (vi) welding rods
 - (vii) greases, paints, chemicals
 - (viii) mouldings (plastic or chrome)
 - (ix) decals

B. Warehouse Safety Procedures**3 Hours**

1. Stocking
 1. Demonstrate correct stocking procedures and precautions for:
 - (a) flammable, corrosive and toxic fluids (properly marked containers)
 - (b) fragile and perishable
 - (c) interpretation of recognized safety standards and instructions
 - (d) use of guard rails or enclosures when required
2. Equipment
 1. Maintain equipment, use:
 - (a) inspectional schedules and be responsible for:
 - (i) tires
 - (ii) hydraulic and electrical systems
 - (iii) wire rope attachments
 - (iv) lifting and driving chains

TOPIC

COURSE OBJECTIVES

	(v) shelving pallets, storage racks and bins (vi) jacks, dollies and conveyors (b) cleaning methods and schedules (c) maintenance reports and equipment logs (d) recognition of hazardous condition of ladders, stairways, lights, floors and ramps	
3. Protective clothing and equipment	1. Use the recommended protective clothing and equipment.	
4. Ventilation	1. Recognize and use proper venting for batteries and chemicals.	
	2. Describe the need for eyewash for battery filling area.	
5. Proper lifting techniques	1. Be aware of correct lifting techniques to avoid back injuries.	
C. Fire Prevention and Control		3 Hours
1. Classes of fires	1. Identify the classes of fires: (a) class A — ordinary combustibles; wood, paper, packing, etc. (b) class B — petroleum and synthetic materials; paint, gasoline, etc. (c) class C — equipment, electrical, internal combustion, etc. (d) class D — combustible materials, magnesium, etc.	
2. Fire extinguishers	1. Identify the following types of fire extinguishers: (a) water; stored pressure, cartridge operated, soda acid (b) carbon dioxide (CO₂) (c) dry chemical (d) multi purpose (e) halon (f) overhead sprinklers (i) line storage (wet or dry) (ii) temperature controlled (loading docks) (g) fire blankets	
3. Fire extinguisher use	1. Know the applications and limitations of fire extinguishers including: (a) effectiveness in relation to the stage of the fire (b) procedures and precautions where sprinkler systems are installed	
4. Fire extinguisher servicing	1. Describe the recommended cycles for servicing and by whom.	
5. Emergencies	1. Describe procedures and precautions in case of an emergency including: (a) awareness and importance of (i) position and condition of equipment (ii) specific assignments of personnel (iii) location and operation of alarm systems (iv) location, operation and procedures of emergency exits (v) fire drills (vi) being able and willing to use fire fighting equipment (vii) evacuation	
6. Fire hazards	1. Identify potential fire hazards that can be caused by: (a) accumulations of dust, and other kinds of dirt (b) faulty wiring and equipment (c) leaking containers (d) accumulations of oily trash (e) improper methods of handling flammables (f) violations of safety rules and regulations (i) storage exit doors (ii) fire fighting equipment (iii) fire doors	
7. Associated fire hazards	1. Identify and describe other hazards associated with a fire out break including: (a) smoke and toxic gas inhalation (b) entrapment (c) failure of delinquent reporting of fire equipment being used (d) electrical panels	

TOPIC	COURSE OBJECTIVES	
D. Warehouse Security Procedures		3 Hours
1. Lock-up	1. Describe the importance of established: (a) lock-up schedules and sequences. (b) key control (c) activation and deactivation of electronic security systems	
2. Responsibility	1. Designate individuals for certain responsibilities toward security.	
3. Illegal or forced entry and loss	1. Identify illegal or forced entry and loss. 2. Identify conditions conducive to illegal entry or theft: (a) unrestricted access to attractive merchandise (b) inadequate locks and security provisions (c) recognition of theft motivations and psychologies	
4. Display cases	1. Describe security provisions for display cases and area.	
5. Bonding	1. Describe employee bonding procedures.	
6. New employees	1. Make new employees aware of employers security policies.	
SECTION THREE:	IDENTIFICATION OF PARTS	150 Hours
TOPIC	COURSE OBJECTIVES	
	Upon successful completion of each section the apprentice should be able to:	
A. Engines 6 Hours		
1. Types, applications and design of: (a) 4-stroke cycle — gasoline liquid cooled (b) 4-stroke cycle — gasoline air cooled (c) 2-stroke cycle — gasoline (d) 2-stroke cycle — gasoline air cooled (e) 4-stroke cycle — diesel, natural gas liquid cooled (f) 2-stroke cycle — diesel, natural gas liquid cooled (g) rotary engine design, function and components	1. Identify the different types and applications of engines. 2. Explain the stages of development of the internal combustion engine. 3. Explain the principles of operation. 4. Identify the different designs of engines.	
2. Cylinder and valve arrangement	1. Describe applications and terminology of designs: (a) according to number and arrangement of cylinders (b) according to position and arrangement of valves	
B. Engine Components		6 Hours
1. Engine block manufacture (a) manufacture	1. Describe the reasons for preference of cast materials. 2. Identify terminology for the following: (a) die cast metal (b) pressure casting (c) pour molten cast iron (d) pour molten aluminum (e) pans and covers (f) gaskets and seals (g) inserts — bushings	
C. Liner, Sleeves, Pistons, Piston Rings		6 Hours
1. Liners (sleeves) (a) wet liner (b) dry liner (c) ported liner (d) seals	1. Identify different types of liners. 2. Describe the purpose of liner seals.	

TOPIC	COURSE OBJECTIVES	
2. Pistons	1. List and define piston terminology. 2. Describe the function of a piston. 3. List materials pistons are made from. 4. Describe designs and construction of pistons. 5. Identify piston pin types and designs.	
3. Piston rings	1. Identify piston rings and define terminology used. 2. Describe the function of rings: (a) compression and oil control (b) expander 3. Identify and describe materials used for rings. 4. Identify and describe designs of rings: (a) step cut (b) straight cut (c) keystone (d) etc.	
D. Connecting Rods, Crankshaft		3 Hours
1. Connecting rods	1. Identify connecting rod material (cast or forged). 2. Identify and describe designs of connecting rods. 3. Describe retaining methods.	
2. Crankshafts	1. Identify crankshaft material (cast or forged). 2. Identify different designs of crankshafts. 3. Identify crankshaft gears, pulleys and sprockets. 4. Identify main bearings and connecting rod bearings. 5. Identify methods of lubricating main and connecting rod bearings. 6. Identify undersize bearings and explain their purpose.	
E. Balancers, Dampers and Counterweight		1 Hour
1. Function	1. Describe the function of balancers, dampers and counterweights.	
2. Design	2. Identify different designs of balancers, dampers and counterweights.	
F. Camshaft		2 Hours
1. Function	1. Explain the function of a camshaft in relation to: (a) fuel pump operation (b) distributor drive (c) auxiliary systems (d) high performance engines (e) timing (f) cam durations (g) oil pump drive	
2. Design and location	1. Identify camshaft applications: (a) single and twin overhead design (b) conventional camshaft design (c) method of retaining camshafts	
3. Construction terminology	1. Describe camshaft construction and explain the "parkerizing" process.	
4. Bearings	1. Identify camshaft bearings.	
G. Cylinder Head		6 Hours
1. Types and designs	1. Identify all types and designs of cylinder heads including materials used.	
(a) materials		

TOPIC

COURSE OBJECTIVES

2. Combustion chamber
 - (a) open
 - (b) pre-combustion
 - (c) energy cell
 - (d) turbulence chamber

3. Valve train

4. Mechanical measuring tools
 - (a) rules
 - (b) calipers
 - (c) micrometers
 - (d) dial indicators
 - (e) etc.

H. Fuel and Induction Systems

1. Gasoline engines
 - (a) gasoline characteristics
 - (i) octane ratings
 - (ii) anti-knock qualities
 - (iii) gasoline qualities
 - (iv) storage stability
 - (b) fuel pumps
 - (i) mechanical
 - (ii) electric (two types)
 - (iii) combination pump (fuel and vacuum)
 - (c) fuel filters
 - (i) fuel bowl (sediment bowl)
 - (ii) screens
 - (iii) paper type filter
 - (d) carburetors
 - (i) types and designs
 - side draft
 - updraft
 - downdraft

1. Identify combustion chamber design.
2. Explain the function of a combustion chamber and use of relative terminologies.

1. Describe the types and designs of valve trains.
2. Describe the function of:
 - (a) valves (exhaust/intake)
 - (b) guides (integral/replaceable)
 - (c) rotators
 - (d) springs and retainers
 - (e) seats (integral/inserts)
 - (f) belts
 - (g) chains (silent, roller)
 - (h) gears (fiber, metal)
3. Describe types and functions of:
 - (a) valve push rods
 - (b) rocker arms
 - (c) valve bridges
4. Identify rocker arms and adjustment parts.
5. Identify rocker arm shafts and bushings.
6. Describe types and functions of lifters:
 - (a) solid (mechanical)
 - (b) hydraulic
 - (c) roller

1. Identify common types and applications of the tools listed.
2. Demonstrate use of metric measuring tools.
3. Demonstrate use of metrics used to measure:
 - (a) mass
 - (b) volume
 - (c) area
 - (d) force
 - (e) torque
 - (f) velocity

16 Hours

1. Recognize and describe composition of internal combustion fuels including qualities listed.
2. Identify types and applications of fuel pumps.
3. Describe fuel pump relationship to the camshaft.
4. Identify serviceable and non-serviceable types of fuel pumps.
5. Identify types of gasoline lines, tanks and connections.
6. Identify types of fuel filters.
7. Identify types and designs of carburetors.
8. Identify carburetor circuits and describe their function.
9. Identify parts of a carburetor.
10. Describe the relation of the carburetor to the design and purpose of the engine.
11. Describe design and function of gasoline fuel injection.
12. Identify the major components of gasoline fuel injection.

TOPIC

COURSE OBJECTIVES

- (ii) carburetor circuits
 - choke
 - low speed
 - high speed
 - float
 - accelerating
 - power
 - idle
 - (iii) carburetor to engine design
 - single barrel
 - two barrel
 - four barrel
 - variable venturi
 - (e) gasoline fuel injection
2. Diesel engines
 - (a) diesel fuel
 - (b) basic fuel injection
 - (c) supply pumps
 - (d) filters
 - (e) injectors
 - (f) governors
 - (g) protective systems
1. Describe characteristics of diesel fuel including:
 - (a) grades
 - (b) safety and storage
 2. Describe the basic fuel injection system layout of:
 - (a) tanks
 - (b) lines
 - (c) pumps
 - (d) injectors
 - (e) filters
 3. Describe the operating principles of:
 - (a) multi-plunger
 - (b) distributor
 - (c) unit injectors
 - (d) pressure timed
 4. Identify the styles and types of supply pumps.
 5. Identify types and applications of filters.
 6. Describe operating principles of injectors and fuel lines.
 7. Identify types of governors and describe principles of operation:
 - (a) mechanical
 - (b) hydraulic
 - (c) electric
 - (d) pneumatic
 8. Identify protective systems and principles of operation for:
 - (a) low pressure
 - (b) high coolant temperature
 - (c) over speed devices
 - (d) high vibration devices
3. Liquefied petroleum gas (L.P.G.) engine
 - (a) liquefied petroleum gas
 - (b) L.P.G. characteristics
 - (i) octane ratings
 - (ii) vaporization
 - (iii) relatively free of sulphur
 - (iv) engine designed with higher compression ratio
 - (c) fuel distribution systems
 - (i) L.P.G. lines
 - (ii) regulator
 - (iii) converter
 - (iv) fuel strainer
 - (v) carburetor
 - (vi) tank
 1. Recognize and describe the composition of L.P.G. gas.
 2. Explain that L.P. gas may be all propane or all butane or a combination of both.
 3. Recognize and explain L.P.G. characteristics listed.
 4. Identify and describe the function of the components listed of a fuel distribution system.

TOPIC

COURSE OBJECTIVES

4. Natural gas
 - (a) gaseous fuel
 - (i) natural gas
 - (ii) manufactured gases (butane and propane)
 - (iii) by-product gases
 - (b) components
 - (c) dual fuel engines
 - (d) fuel tanks

1. Describe the composition of natural gas and manufactured gases derived from natural gas.
2. List the distinctive characteristics of natural gas and its by-products.
3. Describe the principles of operation of:
 - (a) gas injection valves
 - (b) regulators
 - (c) carburetors
4. Explain dual fuel engines and understand operation of:
 - (a) pilot oil operation
 - (b) spark plug operation
 - (c) lines and connections
5. Describe fuel tanks and storage vessels for natural gas.
6. Describe reasons for gas pressurization.

I. Air Induction Systems

6 Hours

1. Precleaners
2. Air cleaner
 - (a) dry
 - (b) oil bath
3. Naturally aspirated
 - (a) typical intake manifolds
 - (b) integral intake manifolds
 - (c) crankcase intake
 - (d) manifold coolers
4. Supercharger, turbocharger and scavenging
 - (a) positive displacement
 - (b) centrifugal blowers
 - (c) piston type
 - (d) turbine driven blowers
 - (e) support components

1. Identify types and functions of:
 - (a) precleaners
 - (b) prescreener
2. Describe precleaner maintenance precautions.
1. Identify types and functions of air cleaners:
 - (a) centrifugal
 - (b) self-cleaning
 - (c) air cleaner indicator
 - (d) thermostatically controlled
1. Identify different styles and types of intake manifolds.
2. Describe the function of intake manifolds.
3. Describe the relationship of turbo-charger and supercharger to the intake manifold.
1. Identify types and designs.
2. Describe principles of operation and function.
3. Describe turbocharger storage procedures and precautions.
4. Demonstrate shipping and handling procedures on turbo equipped engines.

J. Engine Lubrication Systems

3 Hours

1. Oils and systems
2. Filters
3. Oil pumps
 - (a) gear
 - (b) rotor
 - (c) vane
 - (d) plunger
4. Coolers

1. Identify types and grades of oils — API and SAE.
2. Identify oil service conditions (SA, SB, SC, SD, SE, SF)
3. Explain the purpose of a lubrication system and additives.
4. Identify types and designs of lubricating systems and explain their operational principles.
5. Describe the capacity and oil expansion relationship in a system.
1. Identify filters and filter circuits.
1. Describe designs and functions of oil pumps.
1. Describe the function of coolers.
2. Identify types and designs of coolers.

TOPIC

COURSE OBJECTIVES

5. Terminology

1. Interpret descriptive terminology and identification of:
 - (a) seals
 - (b) gaskets
 - (c) galleries
 - (d) lines
 - (e) ventilation caps
 - (f) relief valves
 - (g) sumps

K. Engine Cooling Systems

3 Hours

1. Liquid and air systems
2. Controls
 - (a) thermostats
 - (i) bellow
 - (ii) pellet
 - (iii) sensors
 - (iv) senders
 - (v) bimetal
 - (b) flow indicators
 - (c) shutter types and controls
3. Deflectors, shrouds and baffles
4. Coolant reclaimers (overflow)
5. Radiators and heat exchangers
6. Fans
 - (a) blower
 - (b) suction
 - (c) reversible
 - (d) belts and hydraulic driven (viscous, fluid couplings)
 - (e) thermostatically and centrifugally controlled
 - (f) electrically driven fans
 - (g) flex fans
7. Anti-freeze chemicals
8. Filters and conditioners

1. Identify types of liquid cooling systems.
2. Describe the principles of operation of a water pump system.
3. Describe pressure and how it relates to heat transfer in a cooling system.
 1. Identify and describe operating principles of the controls listed.
 2. Identify and explain the functions of shutters and shutter controls.
1. Identify and describe their function in a system.
1. Identify and describe the function of coolant reclaimers.
1. Identify the types and explain the function of radiators and heat exchangers.
2. Explain the structural and functional differences between radiators and heat exchangers.
3. Identify applications for radiators and heat exchangers.
1. Explain the function of fans in cooling systems, and identify parts therein.
1. Identify types of anti-freeze chemicals.
2. Calculate anti-freeze ratio mixtures.
1. Identify filters and conditioners used in cooling systems.

L. Exhaust Systems

2 Hours

1. Manifolds
 1. Identify types and designs of exhaust manifolds and headers.
 2. Describe the function of manifolds.
 3. Describe the relationship of turbo charger and supercharger to exhaust manifolds.
 4. Identify and describe the function of a heat control valve (exhaust).

TOPIC

COURSE OBJECTIVES

2. Mufflers

- (a) silencer
- (b) resonator
- (c) straight through
- (d) reverse flow
- (e) piping systems
- (f) hangers, clamps and insulator
- (g) catalytic converters

- 1. Describe types, designs and functions of mufflers and catalytic converters.
- 2. Identify pipes, hangers, clamps, insulators and other exhaust parts.

M. Power Train

30 Hours

1. Bearings

- 1. Describe the function of bearings:
 - (a) support
 - (b) reduce friction
 - (c) reduce wear
 - (d) provide a replaceable wear surface
- 2. Identify types of bearings including:
 - (a) anti-friction bearings (roller bearings)
 - (b) friction type (bushings)
- 3. Identify the basic parts of an anti-friction bearing:
 - (a) outer race (cup)
 - (b) inner race (cone)
 - (c) separator (cage)
 - (d) elements (rollers, balls, needles)
 - (e) sealed and shields
- 4. Describe bearing capacities:
 - (a) size of bearing
 - (b) number of rolling elements
 - (c) type of races
- 5. Identify types of ball bearing races:
 - (a) Conrad bearing
 - (b) full type bearing
 - (c) split race bearing
 - (d) angular contact bearing
- 6. Identify the four basic designs of ball bearings:
 - (a) radial load
 - (b) radial and thrust load
 - (c) self aligning radial load
 - (d) thrust load
- 7. Identify the four basic designs of roller bearings:
 - (a) radial load straight
 - (b) radial thrust tapered
 - (c) self aligning radial thrust spherical rollers
 - (d) self aligning radial thrust concave rollers
- 8. Identify two main types of needle bearings:
 - (a) radial load bearings
 - (b) thrust load bearings

2. Seals

- 1. Describe functions of basic seals:
 - (a) to keep in fluids
 - (b) keep out dirt
 - (c) to hold pressures or vacuums
- 2. Identify the two basic types of seals:
 - (a) dynamic — to seal moving parts
 - (b) static — to seal fixed parts
- 3. Identify basic types of radial lip seals (bonded seals and assembled seals).

TOPIC

COURSE OBJECTIVES

- | | |
|---|--|
| <p>3. Clutches</p> <p>(a) single plate</p> <p>(b) spring loaded</p> <p>4. Standard transmissions up to</p> <p>(a) four speed</p> <p>5. Drive lines</p> <p>6. Rear axle assemblies</p> | <p>(a) single lip seal (not spring loaded)</p> <p>(b) single lip seal (lip spring loaded)</p> <p>(c) double lip seal (one lip spring loaded)</p> <p>(d) dual lip seal (both lips spring loaded)</p> <p>(e) other special lip seals</p> <p>(f) hydrodynamic seal (lip grooves direct oil back to sealing area)</p> <p>(g) split seals (for difficult installations)</p> <p>(h) external seals (for fixed shaft and rotating bore)</p> <p>(i) diaphragm seal (static or dynamic diaphragms)</p> <p>4. Identify sealants (hardening and non-hardening types).</p> <p>5. Identify packings:</p> <p>(a) fabric packing</p> <p>(b) metallic packing</p> <p>(c) lip type packings (flange, cup, U-cup, U-ring, and V-ring packings)</p> <p>(d) squeeze type packing</p> <p>(e) the "O" ring</p> <p>(f) felt radial packings</p> <p>1. Describe the principles of operation of a clutch.</p> <p>2. Describe the clutch actuating methods.</p> <p>3. Identify the basic parts of a clutch system.</p> <p>1. Identify different types and designs of standard three and four speed transmissions.</p> <p>2. Describe the principles of operation.</p> <p>3. Identify lubrication required for standard transmissions.</p> <p>4. Identify the parts of the standard transmission.</p> <p>1. Identify the types and functions of drive lines.</p> <p>2. Identify the type and functions of universal joints.</p> <p>3. Identify related drive line components.</p> <p>1. Describe the function and principles of operation of rear axle assemblies.</p> <p>2. Identify different types of:</p> <p>(a) housings</p> <p>(b) axles</p> <p>(c) crown and pinion gearing</p> <p>(d) differential parts</p> <p>3. Calculate gear ratios.</p> <p>4. Identify types of lubrication for differentials.</p> <p>5. Identify front wheel drive units and components.</p> |
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|--|---|
| <p>N. Suspension and Steering</p> <p>1. Suspensions (Wheeled transportation vehicles)</p> <p>2. Springs and related parts</p> <p>(a) leaf</p> <p>(b) coil</p> <p>(c) torsion bar</p> <p>(d) air</p> | <p>1. Identify parts, types and designs of suspensions.</p> <p>2. Describe the principles of operation and function of suspensions.</p> <p>3. Identify and describe the function of major components:</p> <p>(a) springing systems</p> <p>(b) stabilizers and shock absorbers</p> <p>(c) gas loaded springing systems</p> <p>1. Describe types and applications.</p> <p>2. Describe the principal function of springs.</p> <p>3. Identify other devices with similar functions.</p> <p>4. Identify spring fittings:</p> <p>(a) insulators</p> |
|--|---|

18 Hours

TOPIC

COURSE OBJECTIVES

	(b) shackles (c) rebound clips (d) centre bolt (e) U bolt
3. Steering (mechanical aspect of system only)	5. Identify types of shock absorbers. 6. Describe the function and operating principle of a shock absorber. 7. Describe shock absorber mounting methods. 1. Identify types and designs of steering systems. 2. List and describe the function of major components: (a) steering gears (b) drag link (c) steering arms (d) joints and fittings 3. Describe steering gear lubrication provisions.
4. Rear suspensions (on highway)	1. Identify types and designs of rear suspension. 2. Identify rear suspension systems: (a) leaf (b) torsion bar (c) air cushion (d) coil 3. Identify and describe the function of major components.
5. Wheels, tires and hubs	1. Interpret the sizing of wheels, tires and hubs. 2. Identify wheel design and type. 3. Identify wheel construction methods and materials. 4. Identify wheel attaching methods. 5. Describe wheel mounting and installation precautions. 6. Describe reasons for balancing. (a) static and dynamic 7. Define tire ballast and understand its use. 8. Describe tire construction and application.
O. Braking Systems (other than air)	
1. Hydraulic drum brakes	1. Describe principle of operation (Pascal's Law): (a) relation of temperature to volume increase (b) relation of gases to fluids (c) characteristics of hydraulic brake fluid 2. Identify types of hydraulic drum brakes: (a) self energizing (b) double cylinder (c) servo-acting (d) self-adjusting 3. Describe brake application methods: (a) manual (b) power assist 4. List and describe the function of major components. 5. Identify types and designs of master cylinders. 6. Describe the principle of operation of a master cylinder. 7. Identify properties of brake line material. 8. Identify brake design in relation to heat dissipation. 9. Describe brake relining procedures (theory application only).

12 Hours

TOPIC

COURSE OBJECTIVES

2. Hydraulic disc brakes 3. Hydraulic brake systems (vacuum assist) 4. Hydraulic brake systems (air over hydraulic) 5. Hydraulic brake systems (hydraulic over hydraulic) 6. Electric brake systems (a) dynamic braking systems 7. Brake accessory systems (a) parking brake systems	10. Identify drum reconditioning limitations by markings. - Describe the principle of operation of disc brakes. - Identify the common types and applications. - Identify major components of hydraulic disc brakes: - Describe types and details of construction of disc (rotor). - Describe caliper function and principles of operation. - Identify types and application of calipers. - Identify types and application of valves. - Describe operating principles of valves. - Identify brake warning devices that use system pressure. - Identify brake pad wear indicators. - Identify special materials required: - brake fluid - front wheel bearing lubricant - Describe the relationship of heat and friction. - Demonstrate the proper handling and precautions for brake fluid and linings. - Identify types and designs of hydraulic brake systems with vacuum assist. - Describe the principle of operation. - List and describe the function of major components. - Explain the relationship of atmospheric pressure to piston area. - Identify types and designs. - Describe the principle of operation. - List and describe the function of major components. - Describe the relationship of this system to the other hydraulic systems. - Describe the principle of operation (theory application only). - List and describe the function of major components. - Identify parking brakes that utilize: - drive shaft - wheels - Describe the parking brake system relationship to other brake systems.
P. Electrical 1. Fundamentals of electricity - terminology - volts - amps - ohms - resistance - current flow - voltage drop - conductors - insulators - semi conductors - types of circuits - symbols - diodes - transistors	30 Hours - Define the terminology listed. - Explain the difference between series and parallel circuits.

TOPIC	COURSE OBJECTIVES
2. Batteries	1. Identify types of batteries. 2. Describe the AABA sizing of batteries (grouping and sizing). 3. Identify battery ratings and determine if wet or dry. 4. Describe battery storage procedures. 5. Demonstrate proper battery handling procedures. 6. Describe the formula of battery acid (electrolyte) including (a) handling and safety (b) storage 7. Demonstrate charging procedures and precautions.
3. Charging systems (a) AC and DC generators 12-24-12/24 volt (b) AC and DC controls (c) wiring and connectors (d) supporting equipment	1. Identify the components and parts of the charging system listed.
4. Cranking systems (electrical) (a) cranking motors 12-24 volt (b) cranking motor drives (c) cranking motor controls (d) wiring and connectors (e) supporting equipment	1. Identify the components and parts of an electrical cranking system.
5. Ignition systems (battery) (a) distributors (i) standard (ii) electronics (b) spark plugs (c) wiring and connectors (d) supporting equipment	1. Explain the difference between standard and electronic distributors and identify parts of both. 2. Identify spark plugs, explain "reach" and "heat range". 3. Identify wiring, connectors and supporting equipment.
6. Ignition systems (magneto-high and low tension) (a) standard (b) solid state (c) supporting equipment	1. Identify magneto parts and supporting equipment. 2. Explain the difference between "high and low tension".
7. Accessories (a) windshield wipers and washers (b) power windows (c) power seats (d) speed controls (e) lights (f) window defrosters (g) gauges and indicators (h) switches (i) bulbs (j) electronic analysis (self) (k) coolant and lube heaters	1. Identify the accessories listed and parts thereof.
8. Cranking systems (non electric) (a) auxiliary engine (b) air (i) air motors (c) hydraulic	1. Identify starters other than electric.

TOPIC

COURSE OBJECTIVES

Upon successful completion of each section the apprentice should be able to:

A. Standard Stock Recognition**10 Hours**

1. Fasteners

1. Identify the following nuts, bolts and terms:
 - (a) sizing standards (SI, inch)
 - (i) number (mm)
 - (ii) fractional and decimal
 - (b) type of thread
 - (i) unified standard fine
 - (ii) unified standard coarse
 - (iii) metric
 - (iv) machine
 - (c) tensile strength markings and gradings
 - (d) locking provisions for nuts
 - (i) castellated
 - (ii) slotted
 - (iii) tension
 - (e) special purpose bolts and cap screws
 - (i) bored
 - (ii) waisted
 - (iii) predetermined shear point
 - (iv) heat and seize resistant (cylinder head, turbocharger)
 - (f) bolts, descriptive terms
 - (i) carriage
 - (ii) machine
 - (iii) plow
 - (iv) blade and point attaching
 - (g) interpretation of machine screw description (e.g. 4-42, 6-36, 8-32, etc.)

2. Lines and fittings

1. List and identify materials used for lines and fittings:
 - (a) steel
 - (b) copper
 - (c) plastic
 - (d) aluminum
 - (e) others
2. Describe the relation of the line material to its function:
 - (a) brake line/steel, etc.
3. Identify the following line fittings:
 - (a) inverted flare
 - (b) compression nut
 - (c) unions and connectors
 - (d) bushings and reducers
 - (e) flare
 - (f) threaded sleeve
 - (g) pipe
4. Describe the purpose, applications and materials for flexible lines.
5. Identify hose by size and function.
6. Identify the type of hose (according to function). (e.g. air, fuel, high pressure hydraulic, static, vacuum)
7. Identify hose clamps and fittings.
8. Identify locking and security items:
 - (a) cotter pins, dimensional and functional identification
 - (b) tubular pins, dimensional and functional identification
 - (c) woodruff keys, dimensional and functional identification
 - (d) square keys (key stock) dimensional and functional identification

TOPIC

COURSE OBJECTIVES

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|---|--|
| | <ul style="list-style-type: none"> (e) spring locks (f) snap rings, internal and external (g) lock wire |
| 3. Materials and processes | <ul style="list-style-type: none"> 1. Identify materials and processes used for manufacturing standard stock and materials: <ul style="list-style-type: none"> (a) castings, aluminum, iron, steel, plastics, etc. (b) forgings (c) extrusions (d) stampings |
| 4. Compounds and mixtures | <ul style="list-style-type: none"> 1. Identify compounds and mixtures for: <ul style="list-style-type: none"> (a) antifreeze solutions for fuel, cooling and/or washer systems (b) remedial mixtures and compounds <ul style="list-style-type: none"> (i) leak repair (ii) cooling system cleaners (iii) brake and hydraulic fluids (iv) cements and sealers (v) related sales value (vi) common trade names |
| 5. Specialty items | <ul style="list-style-type: none"> 1. Identify specialty items (single items or packages-assortments): <ul style="list-style-type: none"> (a) washers: types and applications and materials <ul style="list-style-type: none"> (i) flat and lock (ii) shakeproof and saddle (iii) auto body spacers and washers (iv) special purpose (b) rivets and pins (c) seals and "O" rings (d) pipe fittings; materials and sizing (e) shims and shim stock <ul style="list-style-type: none"> (i) brass and steel (ii) functions and applications; caster/camber, pinion position, transmissions, engine, etc. (iii) terms of measurement (f) frost and expansion plugs, types and sizing (g) clips and retainers; throttle and transmission linkage, etc. (h) thread repair devices (heli-coil, etc.) (i) screws <ul style="list-style-type: none"> (i) head design, Robertson, Phillips, etc. (ii) purpose and dimensions, ie. 1/2" sheet metal, binder head (iii) head type, binder, countersink, etc. |
| 6. Shop supplies | <ul style="list-style-type: none"> 1. Properly store and handle welding gases. 2. Interpret markings and sizes of welding rods and electrodes. 3. Demonstrate storage and handling procedure for welding rods and electrodes. 4. Demonstrate storage procedures for wipers and solvents. 5. Identify special tools and equipment including: <ul style="list-style-type: none"> (a) pressure and measuring gauges (b) refacing stones (c) emery wheels and buffers (d) pullers, cutters, etc. 6. Interpret equipment catalogues in terms of requirement and replacement of shop supplies. |
| 7. Repair, rebuild or remanufacture phase | <ul style="list-style-type: none"> 1. Identify repair, rebuild or remanufacture phase of a part including: <ul style="list-style-type: none"> (a) item condition (b) interpretation of "Core" policies (c) awareness of items lending themselves to the rebuild business i.e. engine assemblies, clutch assemblies, starters, alternators, injectors, diesel pumps, tracks, etc. (d) knurling |

SECTION FIVE:**CATALOGUES****20 Hours**

TOPIC

COURSE OBJECTIVES

Upon successful completion of each section the apprentice should be able to:

A. Catalogue Types and Applications**20 Hours**

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|-------------------------|--|
| 1. Function | 1. Describe the basic function of a catalogue. |
| 2. Structure | 1. Describe the general structures of catalogues. |
| 3. Trade abbreviations | 1. Interpret trade abbreviations. |
| 4. Limitations | 1. Describe limitations of a catalogue. |
| 5. Forms and types | 1. Identify the functional purpose of catalogue forms and types including:
(a) master
(b) accessory
(c) supplementary catalogues
(d) special equipment (special list)
(e) collision
(f) cross reference catalogues (interchangeability)
(g) electronic (microfiche)
(h) price listings
(i) service bulletins (where applicable) |
| 6. Microfiche equipment | 1. Identify and demonstrate use of microfiche equipment to the Partsman trade. |

SECTION SIX:**COMMUNICATION****15 Hours**

TOPIC

COURSE OBJECTIVES

Upon successful completion of each section the apprentice should be able to:

A. Awareness of Administrative Structures**1 Hour**

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|---------------------|---|
| 1. Chain of command | 1. Identify the chain of command in a parts department. |
| 2. Positions | 1. Identify names of positions of managerial staff in a parts department. |
| 3. Parts operation | 1. Describe the parts operation relationship to other departments within a company. |
| 4. Company policies | 1. Identify various company policies and their application. |

B. Human Relations and Communication Skills**12 Hours**

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|------------------------|--|
| 1. Listening skills | 1. Demonstrate the use of effective listening skills. |
| 2. Effective dialogue | 1. Maintain and demonstrate effective dialogue including:
(a) vocabulary development
(b) voice inflection
(c) choice of terminology or descriptive phrases. |
| 3. Confidence | 1. Establish and maintain confidence. |
| 4. Motivation | 1. Motivate oneself towards good work habits and scheduling. |
| 5. Attitude | 1. Maintain a good attitude at all times. |
| 6. Telephone | 1. Demonstrate proper use of the telephone. |
| 7. Defensive attitudes | 1. Describe situations that may lead to a defensive attitude and correct these situations. |
| 8. Interpersonal | 1. Get to know yourself through interpersonal skills. |

C. Handwriting Skills**2 Hours**

- | | |
|------------|--|
| 1. Memos | 1. Demonstrate the use memos.
2. Describe proper memo construction. |
| 2. Reports | 1. Organize, assemble and arrange report information. |
| 3. Forms | 1. Complete accurately and neatly any job related business forms. |

SECOND PERIOD TECHNICAL TRAINING PARTSMAN TRADE COURSE OUTLINE

OBJECTIVE:

To extend the objectives proposed for First Period to include the more complex assemblies and units which are standard and/or optional equipment on the various equipment and vehicles served by the motive power replacement industry and to correlate skills with others which comprise the Partsman occupation.

SECTION ONE:	IDENTIFICATION OF ASSEMBLIES AND THEIR PARTS	160 Hours
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TOPIC

COURSE OBJECTIVES

Upon successful completion of each section the apprentice should be able to:

A. Automatic Type Transmissions

30 Hours

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|----------------------------------|---|
| 1. Automatic transmissions | <ol style="list-style-type: none"> 1. Identify common types and makes (automotive and heavy duty types). 2. Describe the basic principles of operation. 3. Describe functions and operations of automatic transmissions. |
| 2. Fluid couplings | <ol style="list-style-type: none"> 1. Identify fluid couplings and their major components. 2. Describe function and principle of operation. |
| 3. Torque converters | <ol style="list-style-type: none"> 1. Identify torque converters and their major components. 2. Describe function and principle of operation. 3. Define torque converter terminology. 4. Describe the functional comparison to fluid couplings and the advantages of torque converters over fluid couplings. |
| 4. Planetary gear assemblies | <ol style="list-style-type: none"> 1. Identify planetary gear assemblies and their components. 2. Describe functions, applications and principle of operation. 3. Define planetary gear terminology. |
| 5. Pressure pumps | <ol style="list-style-type: none"> 1. Identify types and designs of pressure pumps. |
| 6. Clutch packs and assemblies | <ol style="list-style-type: none"> 1. Identify clutch packs and assemblies. 2. Identify types of clutches and number of plates used. 3. Describe: <ol style="list-style-type: none"> (a) actuating methods (b) functions and applications 4. Identify one-way clutches, describe their function and application. |
| 7. Control assemblies | <ol style="list-style-type: none"> 1. Identify and describe the function of: <ol style="list-style-type: none"> (a) drums and bands (b) governors (c) valves and valve bodies (d) servos (e) gaskets, seals, "O" rings and locks |
| 8. Relationship to other systems | <ol style="list-style-type: none"> 1. Describe the operating relationship of automatic transmissions to: <ol style="list-style-type: none"> (a) cooling system (b) power plant (c) final drives |

B. Air Conditioning Systems

10 Hours

- | | |
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| 1. Compressors
(a) piston | <ol style="list-style-type: none"> 1. Identify different types of compressors. 2. Describe: |
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TOPIC	COURSE OBJECTIVES	
(b) rotor (c) vane	(a) compressor function (b) lubrication provisions (c) methods of driving	
2. Condenser and receiver	1. Identify and describe the function of each.	
3. Control mechanisms (a) valves (b) thermostats (c) switches and relays (d) doors and deflectors	1. Identify the control mechanisms listed.	
4. Evaporator	1. Identify evaporators and describe their function.	
	2. Describe evaporator relationship to other parts of an A.C. system.	
5. Refrigerant	1. Identify refrigerants and their designation.	
	2. Describe handling procedures and precautions.	
C. Emission Control Systems		10 Hours
1. Emission controls (a) air injection systems (b) crankcase ventilation systems (c) charcoal cannister systems (d) catalytic converter systems (e) exhaust gas recirculating valve	1. Identify types and applications of emission control systems. 2. Describe principles of operation for the emission controls. 3. Describe modifications to: (a) carburetor and ignition systems (b) exhaust system	
2. Regulatory requirements	1. Describe what emission control systems do.	
	2. Identify the pollutants and their effects.	
	3. Describe legislative stipulations for certain areas and regions.	
3. Service Relationship to other systems	1. Describe service relationship to other systems including: (a) identification of mandatory replacements (b) mandatory replacements and other service procedures (c) mandatory replacements and supersessions	
4. Replacement items (a) p.c.v. valves (b) air distribution tubes and valves (c) pressure caps and cannisters (d) control valves and solenoids	1. Identify replacement items and describe the function of each.	
D. Hydraulic Systems		25 Hours
1. Pascal's Law	1. Define Pascal's Law.	
	2. Describe the principles of operation of a hydraulic system.	
2. Hydraulic fluids	1. Describe the origin (petroleum or vegetable) and composition of hydraulic fluids.	
	2. Describe the function of hydraulic fluid and minimum requirements for a system.	
	3. Identify types and applications.	
	4. Identify storage and handling precautions for: (a) fire hazards (b) contamination	
3. Basic system components (a) pumps (b) reservoirs and filters (c) relief and control valves (d) accumulators (e) cylinders	1. Identify and describe the functions of the components listed. 2. Identify types of pumps including: (a) principles of operation (b) examples of the application of various types. 3. Identify and describe application of cylinders (types).	

TOPIC	COURSE OBJECTIVES	
(i) one and two way (ii) slave (iii) telescoping cylinders (f) seals, glands, gaskets and O'rings (g) hoses, pipes and connectors (h) coolers and heat exchangers (i) motors	4. Define cylinder descriptive terminology.	
4. Hydraulic system applications (a) steering systems (directional control) (b) brake system (c) excavation machines (i) directional control (ii) blade/bucket control (iii) power transmission (transfer or torque) (iv) hoisting and lifting systems (v) drive systems (hydrostatic) (d) hydro boost	1. Identify the most frequent applications of hydraulic systems. 2. Identify the system: (a) open or closed	
E. Air Brake Systems		15 Hours
1. Components (a) compressors (b) valves and controls (c) governors (d) brake chambers and slack adjusters (e) gauges and indicators (f) reservoirs and lines (g) filters and drains (h) spring brake equipment (i) dual air brake systems (j) air dryers	1. Identify and describe the function of the components listed. 2. Describe safety provisions required when servicing brakes.	
F. Steering Systems (Directional Control Systems)		5 Hours
1. Methods of steering (a) articulated (b) coordinated	1. Describe each method of steering and its application.	
2. Suspensions (tracked applications) (a) crawler tracks	1. Identify types and designs. 2. Describe the relation of track tension to operating condition: (a) floatation (b) terrain 3. Describe alignment and measuring procedures. 4. Describe the function of rollers and idlers. 5. Identify types and designs of track frames. 6. Describe function of track frames. 7. Describe types of adjustments to tracks: (a) hydraulic (b) nitrogen (inert gas)	
G. Heavy Equipment Power Train		30 Hours
1. Clutches (spring loaded)	1. Identify types and designs.	
	2. Describe principles of operation.	
2. Clutches (hydraulic loaded)	1. Identify types and designs.	

TOPIC

COURSE OBJECTIVES

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| <p>3. Transmission (standard) 4-5-10-13-15 speed</p> <p>4. Transmission (auxiliary)</p> <p>5. Transfer cases</p> <p>6. Power take-offs</p> <p>7. Axle carrier assemblies</p> <p>(a) single speed double reduction</p> <p>(b) two-speed double reduction</p> <p>(c) planetary</p> | <p>2. Describe principles of operation.</p> <p>1. Identify types and designs.</p> <p>2. Describe:</p> <p>(a) principle of operation</p> <p>(b) lubrication</p> <p>3. Identify transmission parts.</p> <p>1. Identify parts, types and designs.</p> <p>2. Describe:</p> <p>(a) principle of operation</p> <p>(b) lubrication</p> <p>1. Identify parts, types and designs.</p> <p>2. Describe:</p> <p>(a) principle of operation</p> <p>(b) lubrication</p> <p>1. Identify types and designs.</p> <p>2. Describe principle of operation.</p> <p>1. Identify parts, types and designs.</p> <p>2. Describe:</p> <p>(a) principle of operation</p> <p>(b) lubrication</p> <p>(c) shift mechanisms</p> |
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H. Auto Body Parts and Sheet Metal Identification

5 Hours

- | | |
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| <p>1. Number/data plate</p> <p>(a) body number/style</p> <p>(b) paint reference</p> <p>(c) trim reference</p> <p>2. Assembly groups</p> <p>(a) front end</p> <p>(b) doors and centre pillar (when applicable)</p> <p>(c) rear quarter assembly</p> <p>(d) rear end</p> <p>(e) seats</p> <p>(f) cowl</p> <p>(g) roof assembly</p> <p>3. Model and styles</p> <p>(a) doors and center pillar</p> <p>(b) 2-door H.T.</p> <p>4. Glass</p> | <p>1. Interpret information on the number/data plate.</p> <p>2. Identify different manufacturers coding methods.</p> <p>1. Identify the assembly groups of an auto body or passenger enclosure.</p> <p>1. Identify the relation of body groups to models and styles.</p> <p>1. Identify type and application relationship for:</p> <p>(a) passenger enclosures</p> <p>(b) impact resistance</p> <p>(c) tinted or clear</p> <p>2. Identify installation (retaining) fittings and materials.</p> <p>3. Demonstrate storage and handling procedures.</p> <p>4. Interpret and use cross reference listing (N.A.G.S.).</p> <p>5. Identify specially fitted panels, antenna and heat provisions.</p> <p>6. Identify and use reduced handling advantages (supplying as required from the manufacturer's agent as compared to maintaining extensive inventory of glass.</p> <p>7. Describe and demonstrate safety when handling glass.</p> |
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TOPIC	COURSE OBJECTIVES
5. Bright metal trim (embellishments)	- Interpret and properly identify: - mouldings and their position (i.e. belt, wheel opening, etc.) - importance of "RH", "upper", "outer", etc. - identification "Not Included" but expendable items (upholstery fasteners, moulding clips, etc.) - Identify adhesives-hard and soft trim attaching.
6. Tractor and/or machine sheet metal	- Describe inventory position in relation to: - frequency of disbursements - possibility of local fabrication - relation of function as opposed to appearance (protection and safety of operator, shaft U joint coverings) - Identify other applications of essential sheet metal: - chutes and piping - hoppers and tanks, etc.
I. Auto Body Reconditioning Materials	5 Hours
1. Paints and finishes - lacquers - enamels - epoxies - metallics	- Identify types and designation of paints and finishes. - Describe precautions for use of "touchup" packages. - Identify paint additives: - thinners - reducers - dryers - etc. - Identify undercoats for various metal.
2. Abrasives - sandpaper - emery cloth	- Identify types and materials. - Interpret grits and materials (grades). - Describe applications and functions in relation to the intended purpose. - Interpret sizing dimensions of strips, belts and discs.
3. Polishing materials compounds	- Identify rubbing and polishing compounds. - Identify materials used in rubbing and polishing compounds. - Describe application and function in relation to intended use.
4. Bonders and adhesives	- Identify types and describe functions for: - glass installation - insulation application - Describe handling and storage hazards. - Identify related sale possibilities.
J. Farm Equipment	20 Hours
1. Chains - standard roller chains - offset link roller chains - silent chains - standard track chains - sealed and lubricated track chains	- Identify types of chains. - Identify parts of chains and explain functions.
2. Sprockets	1. Identify sprockets and describe their function.
3. Wheeled tractors	- Describe advantages and disadvantages of dual wheels. - Identify attachment methods for dual wheels. - Interpret tractor tire sizes with the use of a chart. - Define "ballast" and describe the reasons for use in farm tractor tires:

TOPIC

COURSE OBJECTIVES

4. Plows

- (a) moldboard
- (b) disc
- (c) chisel

- (a) liquid ballast
 - (b) cast iron weights
 - (c) dry ballast
5. Describe how to use a liquid type pressure gauge when checking pressure in tires with liquid ballast.
 1. Explain the importance of the plow-bottom in relation the total piece of machinery.
 2. Identify the types of plow-bottom designs in use:
 - (a) general purpose
 - (b) high speed
 - (c) slatted
 - (d) stubble
 - (e) scotch
 - (f) deep tillage
 3. Describe the function and types of plow-bottom moldboards; relate types to soil conditions:
 - (a) off-center, soft-center steel
 - (i) sticky soil
 - (b) solid steel
 - (c) chilled cast iron
 - (i) sand, gravelly soils
 4. Explain the purpose and location of the shin and frog on the plow-bottom.
 5. Describe the types of shares used on the the plow-bottom:
 - (a) full-cut
 - (b) narrow-cut
 - (c) heavy-duty, deep-suck
 - (d) hard-surfaced
 - (e) extra-duty-heavy
 - (f) gumbo
 6. Explain the function of the landslide on the plow-bottom and identify the types:
 - (a) adjustable heel
 - (b) reversible wear plate
 - (c) adjustable
 - (d) rolling
 7. Identify the types of standard assemblies which attach the plow-bottom to the plow frame.
 8. Identify the types of attachments associated with the moldboard plow and the purpose of each:
 - (a) rolling coulter
 - (b) disk coulter
 - (c) trash boards
 - (d) jointers
 - (e) moldboard extensions
 - (f) root cutters
 - (g) weed hooks
 - (h) gauge wheels
 9. Identify the types of moldboard plow frames in use:
 - (a) fixed
 - (b) combination
 - (c) adjustable
 10. Explain tillage conditions that best utilize the disk plow.
 11. Identify the major components of the disk plow; locate and label them on a simple diagram:

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COURSE OBJECTIVES

- (a) disk
 - (b) disk bearing
 - (c) rear wheel
 - (d) rear axle
 - (e) disk standard
 - (f) mast
 - (g) support stand
 - (h) remote hydraulic cylinder
 12. Explain the basic operation of a disk plow.
 13. Identify the major parts of the chisel plow:
 - (a) center frame
 - (b) shank
 - (c) extensions
 - (d) outriggers
 14. Identify the types of sweeps, spikes, chisels and shovels that can be used on the chisel plow and field cultivator.
5. Harrows
1. Identify tillage conditions that best utilize operating principles of a disk harrow.
 2. Identify types of disk tillers in use:
 - (a) single-action
 - (b) double-action or tandem
 - (c) offset
 - (d) plowing disks
 3. Discuss blade size, shape, and spacing in relation to efficient disk harrowing.
 4. Describe the components of a disk gang:
 - (a) gang bolt
 - (b) castellated nut
 - (c) bearing
 - (d) grease fitting
 - (e) spool
 5. Explain primary uses for roller and packer harrows.
 6. Identify parts and operation peculiar to roller and packer harrows:
 - (a) spring teeth
 - (b) shovels
 - (c) crowfoot rollers
 - (d) levelling bar
 7. Identify types of wheels utilized by roller and packer harrows:
 - (a) solid rim
 - (b) serrated
 - (c) sprocket tooth
 - (d) crowfoot
 8. Explain the functions of the tooth-type harrows.
 9. Identify sizes and styles of teeth used on tooth-type harrows.
 10. Identify the major frame constructions available for tooth-type harrows:
 - (a) closed-end
 - (b) open-end
 - (c) flexible
6. Seeding equipment
1. Identify types of seeding equipment in use.
 2. Identify replacement parts for seeding equipment.
7. Mowers
1. Identify the types of mowers and their most common uses:
 - (a) rotary mower
 - (b) flail cutter
 - (c) shear type

2. Identify the major components of a mower:
 - (a) main frame
 - (b) drag bar
 - (c) pull bar
 - (d) float spring
 - (e) cutter bar
 - (f) PTO shaft
 - (g) drive belt
 3. Describe the cutterbar in relation to all types of mowers and forage harvesting machinery.
 4. Identify the knife assembly of the cutterbar:
 - (a) knife head
 - (b) knife back
 - (c) knife sections
 - (i) smooth
 - (ii) top-serrated
 - (iii) bottom-serrated
 - (iv) armored or hard surfaced
 5. State the function and type of guards associated with the knife assembly:
 - (a) rock
 - (b) regular
 - (c) lipless
 - (d) two-tined or double
 6. Locate and label the following parts on a simple diagram of a cutterbar:
 - (a) yoke
 - (b) inner shoe
 - (c) outer shoe
 - (d) wear plate
 - (e) knife clip
 - (f) bar
 - (g) grass board
 8. Windrower and hay conditioners
 1. Explain the function of mower-conditioners and windrowers and describe their uses on the modern farm.
 2. Identify the types of mower-conditioners in use:
 - (a) pull-type
 - (b) self-propelled
 3. Identify the types of windrowers in use:
 - (a) auger
 - (b) draper
 - (c) pull-type
 - (d) PTO drive
 - (e) hydraulic-driven pull-type
 - (f) self-propelled
 4. Identify the similarity of mower-conditioner and windrower components and their functions.
 9. Rakes
 1. State the uses of the rake on the modern farm:
 - (a) lift hay and place in windrow
 - (b) windrow straw
 - (c) combine windrows
 - (d) turn windrows
 2. Identify the types of rakes in use:
 - (a) side-delivery rakes
 - (i) parallel-bar rakes
 - (ii) wheel rakes
 - (b) parallel-bar rakes
 - (i) trailed

- (ii) rear-mounted
- (iii) front-mounted

10. Balers

- (a) square
- (b) round

3. Describe the operation, power source, and identify replacement parts for side-delivery and parallel-bar rakes.
1. Describe the use of the baler on the modern farm.
2. Identify the power sources for balers; indicate the most common power source:
 - (a) PTO
 - (b) auxiliary engine
 - (c) self-propelled
3. Describe the pickup reel; indicate the repair parts required.
4. Indicate the purpose of the auger and its location.
5. Describe the purpose and operation of the plunger and plunger knife.
6. Describe the operation and importance of tying mechanism and indicate common replacement parts:
 - (a) needle
 - (b) measuring wheel
 - (c) knotter (Bill Hook)
 - (d) twister

11. Combines

- (a) standard
- (b) gleaner
- (c) rotary

7. Explain the function and operation of the round baler; indicate replacement parts:
 - (a) chamber-rolling baler
 - (b) ground-rolling baler
1. Identify the two major types of combines:
 - (a) self-propelled
 - (b) pull-tupe (tractor pulled)
2. Relate geographical and topographical factors to the types of combines in use:
 - (a) level-land combines
 - (b) hillside combines
 - (c) other special combines
3. State the factors that determine combine size:
 - (a) engine horsepower
 - (b) separator width and length
 - (c) threshing cylinder
 - (d) header size
 - (e) grain tank capacity
4. Indicate the five basic crop harvesting functions:
 - (a) cutting and feeding
 - (b) threshing
 - (c) separating
 - (d) cleaning
 - (e) handling
5. Identify the two types of cutting platforms (cutter bar) and describe their operation:
 - (a) regular
 - (b) draper
6. Identify types of reels and relate operation to the cutter bar:
 - (a) bat type or slat type
 - (b) pickup
7. Explain the function of the following components in relation to the operation of the combine header:
 - (a) pickup platform
 - (b) platform auger
 - (c) feed conveyor

8. Identify and describe the types of cylinders and concaves which make up the threshing mechanism:
 - (a) rasp-bar cylinder and concave
 - (b) spike-tooth cylinder and concave
 - (c) angle-bar cylinder and concave
9. Explain the function and operation of the following components in relation to the separating action of the combine:
 - (a) beater
 - (b) finger grate
 - (c) straw walkers and return pans
10. State the purpose of the cleaning unit of the combine.
11. Identify and explain the methods for delivering the grain to the cleaning area:
 - (a) gravity
 - (b) conveyor belts
 - (c) augers
12. Explain the function and operation of the following components in relation to the cleaning unit of the combine:
 - (a) cleaning fan
 - (i) shutters
 - (ii) windboards
 - (b) cleaning shoe
 - (i) chaffer
 - (ii) sieve
13. Identify and explain the operation of the components involved in handling the combined crop:
 - (a) clean grain auger
 - (b) clean grain elevator
 - (c) upper and lower tailing auger
 - (d) tailings elevator
 - (e) grain tank
 - (f) unloading auger
14. State the three power systems required to operate a modern combine:
 - (a) engine
 - (b) power train
 - (c) hydraulics
15. List the types of engines used in combines.
16. Identify the three basic drive systems associated with combines:
 - (a) propulsion
 - (b) header
 - (c) separator
17. Describe the operation of the clutch on engine powered combines.
18. Identify the types of transmissions used on combines:
 - (a) sliding gear
 - (b) collar shift
19. Indicate the types of gears found in a combine differential:
 - (a) ring gears
 - (b) bevel gears
20. Identify the types of final drive axles found on combines:
 - (a) rigid axle shaft
 - (b) flexible axle shaft
21. Identify the uses for hydraulics associated with the combine:
 - (a) raise and lower header
 - (b) raise and lower reel
 - (c) control ground speed

TOPIC

COURSE OBJECTIVES

12. Manure spreaders

- (a) rear delivery
- (b) side delivery
- (c) liquid

13. Forage harvesters

14. Rod weeders

15. Sprayers

- (d) drive belt pick up
- (e) vary speed of feeder conveyor
- (f) swing unloading auger
- (g) stabilize hillside combines

1. Identify the types of manure spreaders.

2. List and identify common replacement parts.

1. Identify common replacement parts.

1. Identify the major purpose of the rod weeder.

2. Explain the basic operation of the rod weeder and identify common types and sizes.

1. List and identify common replacement parts.

2. List safety precautions concerning the use of spray chemicals.

K. Industrial Equipment

5 Hours

1. Industrial equipment

- (a) crawler tractors
 - (i) loaders
 - (ii) dozers
 - (iii) rippers
 - (iv) winches
- (b) fork lifts
- (c) 4 wheel loaders
- (d) back hoe
- (e) grader
- (f) scraper
- (g) "heavy" haulers

2. "V" belts and pulleys

1. List and identify common replacement parts.

1. Identify different types of "V" belts and pulleys.

2. Interpret sizing and application specifications:

- (a) circumference
- (b) included angle

3. Identify limitations and specific uses.

4. Locate "V" belts and pulleys using cross reference identification.

SECTION TWO:

CATALOGUES

10 Hours

A. Catalogues

10 Hours

1. Functions

1. Describe the basic functions of a catalogue.

2. Structure

1. Describe the general structure of catalogues.

3. Catalogue information

1. Demonstrate the ability to interpret catalogue information.

4. Limitations

1. Identify limitations of catalogues.

5. Forms and types

1. Describe the functional purpose of catalogue forms and types for:

- (a) master
- (b) accessory
- (c) special equipment (special list)
- (d) collision
- (e) supplementary catalogues
- (f) cross reference catalogues, (interchangeability)
- (g) electronic (microfiche)
- (h) price listings
- (i) service bulletins (where applicable)
- (j) supersessions

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COURSE OBJECTIVES

6. Interpretation

1. Interpret:
 - (a) the index
 - (b) identification references
 - (i) serial and model numbers
 - (ii) special references of the manufacturer (after number etc.)
 - (iii) prefixes and suffixes
 - (iv) group and subgroup systems
 - (v) parts numbering systems
 - (vi) supersession listings (cancelled, obsolete, superseded)
 - (vii) replacements and/or substitutions (for---use---)
 - (viii) abbreviations and symbols
 - (ix) color codes (springs), cross references and codes
 - (c) "exploded" and "assembly" illustrations

7. Care and use

1. Demonstrate general care and use of catalogues including:
 - (a) maintaining legibility, updating procedures, revision placing, recognition of the cost of a system of catalogues; retaining past model catalogues for future reference, its value

8. Microfiche and readers

1. Demonstrate procedures and precautions in the use and handling of microfiche and readers.
2. Identify the scope of the microfiche systems.

SECTION THREE:

CATALOGUE APPLICATION

10 Hours

TOPIC

COURSE OBJECTIVES

Upon successful completion of each section the apprentice should be able to:

A. Conversion Lists

4 Hours

1. Conversion listings

1. Describe from manufacturers parts numbers to supplier number i.e. J.I. Case to S.K.F.:
 - (a) purpose(s) of conversion listings
 - (b) proper interpretation of cross references

2. Cross references

1. Use trade name and cross reference numbers to identify several manufacturers who supply the following parts, assemblies and materials:
 - (a) ball and roller bearing assemblies
 - (i) Hyatt
 - (ii) Bower
 - (iii) S.K.F.
 - (b) road wheels
 - (i) Budd
 - (ii) Firestone
 - (iii) Kelsey-Hayes
 - (c) oil filters
 - (i) Wix
 - (ii) Purolator
 - (iii) AC
 - (iv) Fram
 - (d) fuel filters — types and applications
 - (i) Carter
 - (ii) Mack
 - (iii) AC
 - (e) seals and gaskets
 - (i) National
 - (ii) Universal
 - (iii) Victor
 - (f) fasteners (speed nuts, moulding clips, etc.)
 - (i) Bowman
 - (ii) Papco

TOPIC

COURSE OBJECTIVES

- (g) belts and hoses
 - (i) Gates
 - (ii) B.F. Goodrich
 - (iii) Goodyear
 - (iv) Dayco
- (h) electrical system components and materials
 - (i) Motorola
 - (ii) Delco-Remy
 - (iii) Auto-Lite
 - (iv) Lucas
 - (v) Bosch
- (i) lines and fittings
 - (i) Weatherhead
 - (ii) American Brass
 - (iii) Imperial
- (j) shock absorbers
 - (i) Gabriel
 - (ii) Delco
 - (iii) Monroe
 - (iv) Armstrong

B. Special List Equipment Catalogues (S.E.R.T., C.O.P.O., D.S.O.)

3 Hours

1. Purpose
 1. Explain the purpose and use of special list equipment catalogues:
 - (a) importance of serial numbers
 2. Describe the types of equipment commonly serviced by special list equipment catalogues.
 3. Demonstrate the ability to use special list equipment catalogues to supply parts and assemblies.
2. Heavy duty rear axle assemblies
 1. Identify types of rear axle assemblies listed in special list catalogues:
 - (a) 2-speed double reduction
 - (b) single speed single reduction
 - (c) double reduction single speed
 - (d) 2-speed, planetary reduction
 - (e) limited slip applications
 - (f) four-wheel drive applications
 2. Identify trade names for heavy duty rear axle assemblies:
 - (a) Eaton
 - (b) Timken
 - (c) Rockwell standard
 3. Interpret catalogue reference data associated with rear axle assemblies:
 - (a) ratio
 - (b) gear dimensions
 - (c) models and application
 4. Identify bearings and identify acceptable alternates.
 5. Identify parts and assemblies associated with heavy duty rear axle assemblies:
 - (a) bull gear assemblies
 - (b) cams and wedges
 - (c) shift and lockout assemblies
 - (d) bearings
 - (i) lubrication guidelines and capacities
 - (ii) selection of acceptable alternates
 - (e) seals, spacers, gaskets
2. Heavy duty transmissions
 1. Identify types of heavy duty transmissions:
 - (a) 5-10-15 speed
 - (b) semi-automatic shift
 - (c) auxiliary

TOPIC

COURSE OBJECTIVES

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| <p>3. Special engine equipment (truck and tractor packages)</p> <p>4. Special duty chassis equipment</p> | <p>2. Identify trade names for heavy duty transmissions and list several companies that use each type of assembly:</p> <ul style="list-style-type: none"> (a) Spicer (b) Clark (c) Fuller (d) Warner <p>3. Interpret catalogue data associated with heavy duty transmissions:</p> <ul style="list-style-type: none"> (a) ratios (b) series numbers (c) model numbers <p>4. Identify parts and assemblies associated with heavy duty transmissions:</p> <ul style="list-style-type: none"> (a) synchronizer assemblies (b) clutch assemblies (c) clutch brakes (d) oil pumps (e) air shift systems and assemblies (f) electric shift mechanisms <p>1. Identify truck and tractor engine equipment that may be included in special list equipment catalogues:</p> <ul style="list-style-type: none"> (a) brakes and retarders <ul style="list-style-type: none"> (i) Jacobs (ii) Bendix (iii) Caterpillar brake saver (iv) Cummins retarder (b) exhaust systems (c) filter systems (d) cooling systems <ul style="list-style-type: none"> (i) fans and fan hubs (ii) radiators (iii) reclaimers (iv) overflow tanks <p>1. Identify and describe chassis equipment that may be included in special list equipment catalogues:</p> <ul style="list-style-type: none"> (a) suspensions <ul style="list-style-type: none"> (i) hydraulic auxiliary (ii) air assisted (b) hoists and winches (c) steering systems-direct hydraulic and hydraulic assist (d) special protective equipment |
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C. Supersession Lists and Release Bulletins

3 Hours

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| <p>1. Application</p> <p>2. Code symbols</p> <p>3. Release bulletins</p> | <p>1. Explain the function and uses of supersession lists as they relate to the supplying of parts:</p> <ul style="list-style-type: none"> (a) cancelled items (b) obsolete items (c) superseded items (d) change-ups <p>2. Describe the relationship of C.O.S. lists to price lists:</p> <ul style="list-style-type: none"> (a) cancelled (b) obsolete (c) superseded <p>1. Interpret frequently used code symbols:</p> <ul style="list-style-type: none"> (a) "U" (for---use---) (b) "OBS-SP" (c) "D.N.S." (d) "C.N.U." <p>1. Identify and describe the function of release bulletins:</p> |
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TOPIC

COURSE OBJECTIVES

- (a) authority to use modified items
 - (b) authority to apply warranty policies
 - (c) importance of the effective date
- 4. Numerical parts record
 - 1. Interpret and describe the use of numerical parts record (N.P.R.) in locating, pricing, selling, and servicing parts:
 - (a) alphabetical listings
 - (b) numerical listings
 - (c) coding systems

D. Off Campus Visitation (Field Trip) (Optional)

It is recommended that this aspect of the curriculum be directed to the material covered to this point in the course

- 1. Two examples of typical shipping and receiving operations (Jobber; large machine dealership, automotive dealership)
- 2. One example each of a well organized manual catalogues section and an electronic catalogue section (observation and demonstration only)

OBJECTIVE:

SECTION ONE:	INVENTORY CONTROL PROCEDURES	100 Hours
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1. Stock record cards (a) kardex (b) blind (c) visi-card (d) electronic (on line, and in house) 2. Operational methods 3. Forms and tags (a) inventory counting sheets and tags (b) order forms (c) purchase orders (d) packing slips (e) requisitions (f) return forms (g) back order forms (h) picking tags (i) logs (invoice, P.O., shipping, etc.	1. Identify the types and uses of the various kinds of stock room inventory control systems.
	1. Describe the operational methods and procedures of the systems. 1. Describe and demonstrate the use of forms and tags in each system.

1. Record system entries	1. Identify and describe the function of the record system entries listed.
(a) receipts and disbursements	
(b) back orders	2. Describe the importance of current entries for receipts and disbursements.
(c) sales performance	
(d) parts numbers	3. Describe why the dates of transactions are required:
(e) price structure	(a) currency of information
(f) item location	
(g) full item description	4. Identify the state of stock for an item:
(h) dates of transactions	(a) on hand
(i) state of stock of items	(b) on order
(j) permanent and temporary entries	(c) total available
(k) purchases and returns	5. Describe different aspects of permanent and temporary entries.
(l) factory return policies	
(m) lost sales records	6. Identify the proper classifications of customer purchases and returns.

1. Entering receipts	1. Demonstrate the basic procedures of entering receipts.
2. Entering disbursements	1. Describe the importance of identifying direction of disbursement: (a) shop order number (b) work order number (c) sales invoice number (d) E.P.O. number of reference

TOPIC	COURSE OBJECTIVES	
3. New card or item record	2. Describe the importance of keeping disbursement records current.	
	1. Identify the necessary entries for setting up a new card or item record:	
	(a) a continuation card or record	
	(b) a new item	
	(c) an outside supplied item	
	(d) special circumstance or application of an item	
4. Losses and claims	1. Describe the relation of inventory cards to disaster losses and claims:	
	(a) fire	
	(b) acts of God	
	(c) theft	
5. Record procedures	1. Describe relation of proper record procedures to:	
	(a) efficient operation of the department (purchasing/rate of sale)	
	(b) receiving procedures	
	(c) efficient operation of service departments ("down-time" factors)	
	(d) customer relations (ability to honor supply commitments)	
D. Inventory Situations		5 Hours
1. Stock classifications	1. Identify stock classifications (individual items) to:	
	(a) seasonal or fast moving	
	(b) superseded or obsolete items	
	(c) unidentified items and sales trends	
	(d) rebuildable cores	
E. Turn Over		10 Hours
1. Turn over analysis	1. Define the term "turn over" as it relates to inventory control.	
	2. Describe turn over analysis as it pertains to:	
	(a) relation of turn over to investment return (yield)	
	(b) determining the turn over in actual terms	
	(c) descriptive terms of turn over expression	
	(d) relation of turn over to customer service	
	(e) recognition and evaluation of the "low inventory/high turn over" point, or system. Advantages weighed against:	
	(i) down time loss to the customer	
	(ii) production loss to management	
	(iii) time/income loss to mechanics, etc.	
F. Essential Details of Inventory Management		15 Hours
1. Planning	1. Describe the importance and advantages of planning (formulating and the use of forecasts).	
2. Buying	1. Describe productive buying procedures (buying rates in relation to selling rates).	
3. Erratic ordering	1. Describe the effects of erratic ordering (too frequent-not frequent enough).	
4. Prepaid stock order	1. Describe the advantage of prepaid stocking orders (as compared to frequent use of special orders).	
5. Handling parts	1. Identify and describe methods of reducing handling (frequent analysis of time and manpower expenditures).	
6. Factory return policies	1. Identify and describe the position of the "return to factory" policies.	
7. Return policies	1. Identify and describe special application of "return" policies.	
8. Inventory count	1. Describe situations that necessitate an inventory count.	
	2. Identify when it is necessary to take inventory:	
	(a) change of ownership or management	
	(b) other major business situations (i.e. disaster, breach of security, change of systems)	

TOPIC

COURSE OBJECTIVES

- (c) regular cycles, perpetual method
 - (d) "return" information (credit note tracers)
 - (e) checking stock situations (i.e. duplications, obsolescence)
 3. Identify the people responsible for inventory count including:
 - (a) definition and assigning of the responsibilities
 - (b) proper briefing of personnel as to assignments and their completion
 - (c) planning the maximum use of available personnel
 4. Describe and demonstrate stock taking preparations including:
 - (a) sorting and proper identification of mixed stock
 - (b) correction of stock locations
 - (c) identification and definite tagging procedures for unsaleable goods (broken kits; damaged gasket sets, etc.)
 - (d) verification of bin tags
 - (e) assured supply of proper materials (tags, tally sheets, etc.)
 - (f) importance of cutoff dates — packing slips and invoices
 - (g) importance of the time factor
 - (h) the relationship of good housekeeping to faster and more accurate item count
 5. Describe and demonstrate stock taking procedures:
 - (a) legibility of tags (update and replace where necessary)
 - (b) correct units of quantity (gallons of; dozens of; etc.)
 - (c) use of "nil" or "O"
 - (d) prepacking of "highcount" 25's; 100's; etc.) items
 - (e) when applicable; showing location of duplicate (over-stock)
 6. Demonstrate sorting of bin tags as to classification:
 - (a) fast moving
 - (b) discount group
 - (c) seasonal
 - (d) outside supplier
 - (e) special conditions (where applicable)
9. Obsolete materials
 1. Define the term obsolescence and its relation to an overall inventory control system.
 2. Describe the handling of obsolete materials:
 - (a) classes
 - (i) no current application
 - (ii) phase out pending
 - (iii) others
 3. Identify the reasons for obsolescence:
 - (a) superseded
 - (b) discontinued lines
 - (c) unsatisfactory performance
 - (d) nonreturnable special items
 4. Describe and demonstrate disposal procedures:
 - (a) internal policies — application for "write-off" (scrap)
 - (b) subject to factory or supplier policies
10. Standard stock
11. Stock classification
 1. Demonstrate handling of standard stock during inventory count.
 1. Identify the essentials of stock classification.
- G. Ordering 25 Hours
 1. Basic concepts
 1. Describe ordering and the relation to turn over.
 2. Identify procedures and forms for regular restocking prepaid orders including:
 - (a) operational details
 - (b) advantages and disadvantages

2. Stock depletion

3. Terms:
 - (a) define the terms "special", "unit down" and "emergency" orders
 - (b) describe:
 - (i) differences in the procedures and priorities
 - (ii) governing circumstances in the use of each procedure
 - (iii) hazards resulting from improper use of these provisions
4. Describe and demonstrate estimating requirements (stock projections):
 - (a) based on unit population of the territory (or area)
 - (b) based on known service life of replacement items
 - (c) based on known model changes and modifications
 - (d) allowance for impending shortages (advanced advice bulletins)
 - (e) the plus or minus factor in relation to recent ordering patterns
 - (f) inclusion of internally used items and materials (bags, tags, drill bits, cleaners, etc.)
 - (g) awareness of the influence that topographical, climatic and local aspects have on inventory planning (i.e. hills/brake demands; rock/excavation demands; dust/filter demand, etc.)

3. Ordering

1. Describe causes and prevention of stock depletion for:
 - (a) abnormal causes
 - (i) transporation and factory work stoppages
 - (ii) unexpected demand due to premature failures and replacements
 - (iii) new customer (fleet) inventory requirements
 - (iv) branch or sub-dealer openings (draw from main depot)
 - (v) miscalculated space limitations
 - (b) normal (and most frequent) causes
 - (i) unexpected demand sales
 - (ii) deficiencies in ordering procedures
 - (iii) miscalculation of order lead times
 - (iv) miscalculation of disbursement rate
 - (v) delinquent stock record entries
 - (vi) neglecting to constantly review order levels
1. Demonstrate ordering parts and materials from major or parent supplier including:
 - (a) recognition and proper use of specified forms and procedures
 - (b) necessity of complete shipping instructions
 - (c) specific details for special orders
 - (i) serial number
 - (ii) model number
 - (iii) type
 - (iv) date of purchase
 - (v) what the unit is being used for
2. Use orders covering NPN (no Part Number) items:
 - (a) forms
 - (b) descriptive details of both part and unit
 - (c) serial numbers
 - (d) model
3. Identify and describe the function of "supplemental" orders.
4. Describe details of placing the initial stocking order including:
 - (a) area population survey
 - (b) request for graduated delivery of shipment according to a predetermined priority scale
5. Demonstrate the proper use of the following for ordering:
 - (a) telephone
 - (b) telex
 - (c) on-line computer
6. Describe proper use of ordering codes and designations and describe the advantages.
7. Interpret and describe the application of "split orders".

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COURSE OBJECTIVES

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| <p>4. Back ordering</p> | <ol style="list-style-type: none"> 1. Identify the normal causes for back orders: <ol style="list-style-type: none"> (a) temporary shortages (b) unscheduled stoppages 2. Describe the results of back orders. 3. For back orders, describe and demonstrate handling routines including: <ol style="list-style-type: none"> (a) proper recording procedures (particularly on "split shipments" 3 of 12 b.o.) (b) followup procedures 4. Identify classification of "back orders": <ol style="list-style-type: none"> (a) being shipped when available (b) re-order in---days (c) do not re-order (d) condition which result in back order classifications |
| <p>5. New ordering concepts</p> | <ol style="list-style-type: none"> 1. Introduce new concepts developed in inventory management and ordering procedures including: <ol style="list-style-type: none"> (a) direct communication systems for updating stock replacement procedures (full access to entire stock situation of parent companies or major suppliers) (b) computers role in the parts and replacement industry (c) basic exploration of other sophisticated techniques and skills (d) the position (value) of the basic occupational skills in the electronically equipped parts department |
| <p>6. Invoicing</p> | <ol style="list-style-type: none"> 1. Describe the importance of legible entries (penmanship). 2. Use correct extensions and calculations. 3. Describe the importance of correct heading entries: <ol style="list-style-type: none"> (a) name (b) address (c) delivery date (d) P.O. number (e) date of invoice 4. Identify credit verification or status (procedure as per company policy). |
| <p>H. Pricing</p> | <p style="text-align: right;">15 Hours</p> |
| <p>1. Master price list</p> | <ol style="list-style-type: none"> 1. Describe when it is used and why. 2. Interpret the listings of a master price list. |
| <p>2. Price structure</p> | <ol style="list-style-type: none"> 1. Interpret the price structure for: <ol style="list-style-type: none"> (a) "suggested retail" (reasons for this phraseology) (b) "list" and discount classification (c) "exchange" price (d) cost price |
| <p>3. Import materials</p> | <ol style="list-style-type: none"> 1. Identify factors used in the pricing of import materials: <ol style="list-style-type: none"> (a) sales tax application (b) import duties <ol style="list-style-type: none"> (i) interpretation of schedules and rates (ii) use and recognition of correct forms (iii) awareness of the necessity of accuracy in computing (c) calculation of markup (profit on list) |
| <p>4. Price revision</p> | <ol style="list-style-type: none"> 1. Describe an application for a price revision including: <ol style="list-style-type: none"> (a) effective date (b) procedures or policies on incoming prepaid orders (remittance enclosed) |
| <p>5. Consumable items</p> | <ol style="list-style-type: none"> 1. Demonstrate the pricing out procedures on work orders of consumable items and materials: <ol style="list-style-type: none"> (a) cement |

- (b) sealers
- (c) pins
- (d) bolts
- (e) wire
- (f) lubricant

SECTION TWO:**SALES AND MERCHANDISING****50 Hours****A. The Basic Sales Techniques****6 Hours**

1. Personal talents
 2. Selling abilities
 3. Developing talents
 4. Selling requirements
1. Identify the basic skills that a salesperson should possess and utilize.
 1. Describe the relations of selling abilities to personal interests.
 1. Identify effective traits and talents that a salesman can develop.
 1. Identify selling requirements:
 - (a) confidence
 - (b) effective application of specific situations
 - (i) seasonal situations
 - (ii) particular interest situations
 - (iii) recognition of the potential of casual enquiries
 - (iv) setting up the related sale situation
 - (v) terminating a nonproductive argumentative situation
 - (vi) coping with the "product comparison" situation
 - (vii) fostering the "definite requirement" situation
 - (viii) determining the "hard sell"/"soft sell" options of approach
 - (c) importance of the basic concepts
 - (i) product knowledge; own and competitors (for comparison only)
 - (ii) modest confidence
 - (iii) pitfalls of extravagant claims
 - (iv) recognition of product (or service) limitations
 - (v) matching the customer to the sale item
 - (d) matching the product and its selling aspects
 - (i) economy
 - (ii) safety
 - (iii) quality
 - (iv) performance
 - (v) appearance
 - (vi) usefulness
 - (vii) durability

B. The Relationship of Salesmanship and the Personality**6 Hours**

1. What to avoid
 2. Sales vocations
1. Identify factors to avoid in the selling occupation:
 - (a) defensive attitudes
 - (b) derogatory reference to competitors products
 - (c) stereotyped dialogue
 - (i) "eh?"
 - (ii) "okay?"
 - (iii) "y'know!"
 - (d) lack of development of the conversational skills
 - (e) offensive deportment
 - (i) shallow understanding
 - (ii) aloofness
 - (iii) language deficiencies
 1. Identify factors for choosing sales as a vocation or career:
 - (a) matching the ambition to the person
 - (i) prestigious career
 - (ii) temporary position
 - (iii) a job
 - (iv) an experiment in living

TOPIC

COURSE OBJECTIVES

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| | <ol style="list-style-type: none"> 2. Describe the responsibility of sales people including: <ol style="list-style-type: none"> (a) accountability (b) accessibility (c) stability (d) punctuality |
| 3. Selling a service | <ol style="list-style-type: none"> 1. Identify rudiments of selling a service including: <ol style="list-style-type: none"> (a) basic knowledge of the problems pertaining to the service area (analysis service, reconditioning service, etc.) (b) relation of mechanical failure to service and replacement requirements (c) depth of followup on the sale of a "service" (d) relation of the sale of a "service" to the Partsman occupation (i.e. inventory knowledge, etc.) |
| 4. Sales psychology | <ol style="list-style-type: none"> 1. Describe basic sales psychology: <ol style="list-style-type: none"> (a) methods of motivating interest (b) using "objections" to an advantage (c) recognition of the extent and position of the customers relative knowledge and experience (avoiding "talking down to") (d) effective use of the "common interest" factor (i.e. photography, antiques, etc.) |
| 5. Sales leads | <ol style="list-style-type: none"> 1. Identify sales leads from: <ol style="list-style-type: none"> (a) personnel <ol style="list-style-type: none"> (i) repeats (ii) referrals (iii) related sale (b) direct enquiries <ol style="list-style-type: none"> (i) resulting from campaigns (ii) product introduction (iii) product reputation |
| 6. Closing a sale | <ol style="list-style-type: none"> 1. Describe techniques of closing a sale: <ol style="list-style-type: none"> (a) discussion review <ol style="list-style-type: none"> (i) summary and emphasis (ii) agreement on sales conditions, inc. warranties or after sales service (or entitlements) (b) advantages of personality factors in closing a sale (c) anticipating sale "closing" difficulties (d) recognition of the difficulties experienced in making decisions (e) equating the value of the sale to the cost of making the sale (man-hours; space and equipment use; demonstration, etc.) |

C. Merchandising

8 Hours

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| 1. Merchandising | <ol style="list-style-type: none"> 1. Define merchandising. 2. Describe the position of merchandising in a parts and accessories operation as compared to the supply and demand situation, i.e. food) <ol style="list-style-type: none"> (a) the promotional factor of merchandising (minor) (b) the sales factor of merchandising (major) |
| 2. Relation of merchandising | <ol style="list-style-type: none"> 1. Describe the relation of merchandising to: <ol style="list-style-type: none"> (a) inventory planning (b) floor space layout (c) personnel requirement (d) business budgeting (e) turnover factor (f) seasonal items (g) industry requirements (h) "one-shot" promotions |
| 3. Advertising | <ol style="list-style-type: none"> 1. Describe the relation of merchandising to advertising including: <ol style="list-style-type: none"> (a) the position of merchandising in an advertising campaign |

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COURSE OBJECTIVES

- (b) application of the merchandising concept to every P and A transaction: i.e. related sales, realistic suggestions and recommendations

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| 4. Factors affecting merchandising | 1. Identify factors affecting merchandising as an ongoing experience: <ul style="list-style-type: none"> (a) attitudes and appearance of employees (b) condition and location of display areas (c) value of timely and current merchandising themes (d) impact and originality of displays and materials |
| 5. Cost sharing merchandising plans | 1. Describe cost sharing merchandising plans; advantages/disadvantages of participating manufacturers and/or suppliers. |
| 6. Merchandising effectiveness | 1. Identify item areas where merchandising can be most effective: <ul style="list-style-type: none"> (a) engine accessories (b) drive train items (c) exhaust system items (d) guards and sickle knives (e) ripper and scarifier tips |
| 7. Merchandising programs | 1. Identify and apply merchandising programs for: <ul style="list-style-type: none"> (a) seasonal sales (b) new product promotions (c) end of production sales, etc. 2. Identify cost factors and the potential return aspect of merchandising programs. 3. Identify the limitations, responsibilities of advertising campaigns (public safe guards and protection provisions by legislation). |

D. Warehouse and Parts Department (or Area) Planning

30 Hours

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| 1. Regulations | 1. Be aware of local or national ordinances governing: <ul style="list-style-type: none"> (a) bin and shelf materials and spacing in regard to fire (b) heights of bins and widths of aisles |
| 2. Traffic flow | 1. Use planning according to established traffic flow. |
| 3. Sales patterns | 1. Describe how product sales patterns influence bin and shelf layout. |
| 4. Space budgeting | 1. Identify calculated "waste space". 2. Identify danger areas: <ul style="list-style-type: none"> (a) blind corners (b) sharp protrusions 3. Calculate space for: <ul style="list-style-type: none"> (a) shipping, receiving and counter space allowances (b) necessary lighting in relation to bin and shelf placement (c) pickup and back counter provisions (d) fire regulations 4. Estimate adequate space and facilities for clerical work. |
| 5. Overhead racks | 1. Demonstrate the safe use of overhead racks for pipes, tubes, tires, and sheet metal. |
| 6. Planning a parts department | 1. Plan a parts department including: <ul style="list-style-type: none"> (a) areas of planning <ul style="list-style-type: none"> (i) character of material <ul style="list-style-type: none"> — bulky parts — heavy items (ii) counter accessibility <ul style="list-style-type: none"> — front counter — rear counter (iii) width of aisles (iv) bins (v) special equipment |

TOPIC

COURSE OBJECTIVES

- (vi) shipping and receiving
 - (vii) sales area
 - (viii) display area
 - (ix) managers office
 - (x) bin storage
 - (xi) customer parking
 - (xii) room for expansion
 - (b) a class assignment will be to plan to scale, a parts department, which the student will present orally in front of the class
 - (i) instructor evaluation
 - (ii) students comments
7. Plan a warehouse
- 1. Plan a warehouse and include:
 - (a) areas of planning
 - (i) character of material
 - bulky items
 - heavy items
 - (ii) counter space
 - (iii) width of aisles
 - (iv) bins
 - (v) special equipment
 - (vi) shipping and receiving
 - (vii) office area
 - (viii) bin storage
 - (b) a class assignment will be to plan to scale, a warehouse, which will be presented in front of the class
 - (i) instructors evaluation
 - (ii) students comments and evaluation

E. Visitations (Field Visits)

The foregoing time allotments include provision for visitations.

1. If possible, to a firm which has just completed an inventory count or which is preparing to do some stock taking.
2. If possible, to a firm which operates a well planned parts departments, noting the bin, shelf and floor layouts.

SECTION THREE:

COMMUNICATIONS SKILLS AND HUMAN RELATIONS

30 Hours

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COURSE OBJECTIVES

Upon successful completion of each section the apprentice should be able to:

A. Introduction to Business Machines (As Applied to the Partsman Trade)

6 Hours

1. Business machines
 - (a) computer
 - (b) adding machines and calculators
 - (c) typewriters (manual and/or electric)
 - (d) telex
 - (e) telephone recorders
1. Describe the role of business machines in the operation of a parts department:
 - (a) advantages
2. Relate specific office functions to each office machine.
3. Identify basic operating principles and terminology for each business machine.
4. Demonstrate the ability to operate each business machine.

B. Written Communication Skills and Techniques

3 Hours

1. Warranty reports
 1. Demonstrate the need for accuracy of reference material and data.
 2. Use a brief and clear description of the conditions.
 3. Identify policy or memorandum references.
 4. Use positive statements for adjustments carried out.

TOPIC	COURSE OBJECTIVES	
2. Memo construction	1. Identify and properly use prescribed forms. 2. Avoid using slang expressions and clichés. 3. Describe the importance of correct emphasis in memos. 4. Identify the results and effects of implied threats and/or commitments. 5. Identify how moods and attitudes are reflected in letters and memos: (a) controlling the tone of written communications (b) development and recognition of "tone" phrases	
3. Report information	1. Demonstrate the organizing, assembling and arranging of report information.	
4. Written communication	1. Describe and identify the value of planning a written communication: (a) setting the objective or intent (i) enquiry (ii) explanation (iii) request (iv) instruction (b) selecting the phraseology to suit the intent	
C. Human Relations and Communication Skills		9 Hours
1. Communication	1. Define communication: (a) two-way contact that exchanges information or ideas (b) inter-change i.e. transmitting and receiving	
2. Effective dialogue	1. Demonstrate and maintain an effective dialogue including: (a) basic techniques (i) vocabulary development (ii) phrase innovation (iii) voice inflection (b) establishing confidence (c) motivation for dialogue (i) sales motivated (ii) detailed instruction (iii) customer assistance (d) personalities and communication techniques	
3. Oral skills	1. Develop and improve oral skills including: (a) pronunciation, enunciation, thought organization, etc. (b) developing natural and effective techniques for recording devices; dictaphones, tape recorders, etc.	
4. Personnel relations	1. Develop and maintain communication skills in personnel relations (oral and written): (a) effective direction, guidance and supervision (b) adjudication and arbitration situations (c) awareness of employers view-points in the hiring process (i) employee criteria (what an employer is really looking for) (ii) when qualification become secondary to personal attributes	
D. Operational Skills		3 Hours
1. Mathematical skills	1. Develop proficiency in the applicable mathematical skills: (a) chain discounts and discount constants (b) list and successive markups (c) cost markup and markup constants (d) import problems and constants (e) turnover and inventory control calculation (f) use of pricing charts (g) calculating interest on invested capital (h) basic accounting procedures	

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E. Skills for Assisting Partsman

6 Hours

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| 1. Interviewing and hiring | 1. Develop techniques and skills required for interviewing and hiring personnel. |
| 2. Training employees | 1. Train employees in skills and operations of a parts department that you are familiar with. |
| 3. Buying | 1. Develop and demonstrate correct buying techniques. |
| 4. Interstaff relations | 1. Develop and maintain good interstaff relations. |
| 5. Work and procedure organization | 1. Develop and maintain a work and procedures organization for a parts business. |
| 6. Parts department layout | 1. Develop and organize a parts department layout. |
| 7. Warehousing | 1. Develop and maintain good warehousing procedures. |
| 8. Business correspondence | 1. Demonstrate good business correspondence in the context of operating a parts business. |
| 9. Inventory and turnover | 1. Demonstrate skills required to maintain correct inventory control and turnover. |
| 10. Accounting and business procedures | 1. Demonstrate accounting and business procedures for the operation of a parts business. |
| 11. Warranty procedures | 1. Demonstrate knowledge of warranty procedures:
(a) proper administration and formulation of warranty policies
(b) non-warranty return good policy
(c) classifications of non-warranty goods |
| 12. Service department | 1. Develop a knowledge of service department operations:
(a) machine shop
(b) flat rates
(c) other operations that may help promote a sale |
| 13. Wholesale merchandising | 1. Develop and maintain wholesale merchandising accounts. |
| 14. Wholesale sales meetings | 1. Prepare and deliver inspiring wholesale sales meetings. |
| 15. Wholesale accounts | 1. Contact and develop wholesale accounts to maintain good will and aid wholesale salesman. |
| 16. Expense control | 1. Demonstrate the use of knowledge learned in expense control. |

F. Parts Manager Responsibilities

3 Hours

- | | |
|-----------------------|---|
| 1. Job descriptions | 1. Develop and update job descriptions for:
(a) counter sales
(b) order desk
(c) inventory clerk
(d) road sales
(e) shipping
(f) receiving
(g) assistant parts manager |
| 2. Annual budget | 1. Develop and follow up on an annual budget for:
(a) customer service
(b) proper and acceptable inventory levels
(c) acceptable turnover rates
(d) sales goals and profits |
| 3. Plans and programs | 1. Insure that authorized plans and programs are carried out by the parts department:
(a) inventory levels
(b) warranty
(c) customer satisfaction
(d) service and convenience |

TOPIC	COURSE OBJECTIVES
4. Manpower	1. Insure adequate manpower at all times to maintain: (a) proper records (b) storage facilities (c) packaging (d) deliveries and parts sales (e) maintain a display area
5. Personnel	1. Recruit and hire department personnel. 2. Organize and conduct training programs for parts personnel. 3. Evaluate the performance of parts department personnel — vs — job descriptions: (a) salary levels (b) compensation plans (c) maintain up-to-date organization chart
6. Administrative details	1. Maintain proper records. 2. Submit required reports. 3. Check customer credit status. 4. Conduct other administrative details as required by management.
7. Expansion	1. Prepare and recommend plans for expansion. 2. Make necessary purchases of outside supplies and maintenance equipment.
8. Parts literature	1. Properly maintain, keep up-to-date and available: (a) instruction sheets (b) price sheets (c) reference material (d) promotional material (e) etc.
9. Meetings	1. Take an active part in company sales and service meetings. 2. Act as a catalyst in the promotion and sales of parts through every possible means. 3. Maintain contact with customers and constantly evaluate the degree of parts service offered.
10. Operating costs	1. Study operating costs in order to improve the profits of the department: (a) delivery charges and rates (b) paper work procedures (c) telephone bills (d) mechanical handling methods (e) taxes and other hidden expenses
11. Updating	1. Continually study parts management practices and automation. 2. Attend conferences and seminars conducted by manufacturers and associations. 3. Keep up-to-date on the latest and most efficient methods of operating a profitable parts department.

SUGGESTED REFERENCE MATERIALS

Auto Mechanics Fundamentals — M. W. Stockel — M. T. Stockel — Goodheart — Wilcox — Latest Edition

Auto Service and Repair — M.W. Stockel — M. T. Stockel — Goodheart — Wilcox — Latest Edition

Counterman's Handbook — Automotive Service Industry Association

Inventory Control Techniques — Van De Mark — Latest Edition

Inventory Systems and Controls Handbook — Stanley E. Larson

Fundamentals of Service (FOS) Manuals — Deere and Company

- Bearings and Seals

- Tires and Tracks

- Hydraulics

- Power Trains

- Belts and Chains

Fundamentals of Machine Operation (FMO) Manuals — Deere and Company

- Tillage

- Planting

- Combine Harvesting

- Hay and Forage Harvesting

Occupational Health and Safety Act, General Regulations

TECHNICAL TRAINING SCHOOLS

The Partsman apprenticeship training program is offered by Alberta Career Development and Employment, Apprenticeship and Trade Certification. Staff and facilities for teaching the program are supplied by:

1. Northern Alberta Institute of Technology
2. Southern Alberta Institute of Technology
3. Lethbridge Community College
4. Fairview College
5. Keyano College
6. Lakeland College

LOCATION OF APPRENTICESHIP AND TRADE CERTIFICATION REGIONAL OFFICES

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CALGARY
EDMONTON
FORT McMURRAY
GRANDE PRAIRIE
HINTON
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